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Cooperating out of poverty?

Effects of Agricultural Cooperatives on Livelihoods and Food Security in Cambodia

Heino Güldemann, Darina Döbler, Carolin Kern, Josephus Koks, Christopher Korb, Andrej Sbrisny

2021

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Seminar für Ländliche Entwicklung | Centre for Rural Development

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Study in cooperation with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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Preface

For 59 years, the Centre for Rural Development (SLE, Seminar für Ländliche Entwicklung), Humboldt-Universität zu Berlin has trained young professionals in the field of German and international development cooperation.

Three-month empirical and solution-oriented research projects conducted on behalf of German or international development agencies form an integrated part of the one-year postgraduate course. In interdisciplinary teams and with the guidance of experienced team leaders, young professionals carry out assignments on innovative topics, providing consultancy support to the commissioning organizations while involving a diverse range of actors from household to national levels in the process. The outputs of this applied research directly contribute to solving specific development problems.

The studies are mostly linked to rural development themes and have a socio-economic focus, such as improvement of agricultural livelihoods or regimes for sustainable management of natural resources. The host countries are mainly developing or transforming countries, but also fragile states. In the latter, themes such as disaster prevention, peace building, and relief are examined. Some studies develop new methodologies, published in handbooks or guidelines. Further priorities are evaluations, impact analysis, and participatory planning. In the future, however, studies may also take place in the Global North, since the Sustainable Development Goals (SDGs) are a global concern.

SLE has carried out more than two hundred consulting projects in more than ninety countries and regularly publishes project results in this series. In 2020, SLE teams completed studies in Cambodia, Benin, South Africa, and the African Union.

The present study analyses the impacts of agricultural cooperatives in Cambodia and was conducted in cooperation with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The report is also downloadable from www.sle-berlin.de.

We wish you a stimulating read.

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Throughout the research phase, the GIZ ILF project team in Phnom Penh and in the field was of great help and very cooperative regarding both content and administrative issues. They were particularly supportive in the coordination of the interviews and the preparation of the village workshops.

We wholeheartedly thank the great field teams who carried out the research on the ground. Our thanks go to our National Coordinator, Te Ayphalla, for the exceptional management of our research and to Pisey Khin, Chanthan Tha, and the NUPPUN Institute for Economic Research in Phnom Penh for their implementation of a high-quality household survey. Furthermore, our PRA team delivered excellent results even under difficult conditions; thank you Yin Samay (Team Leader), Amrin Sotheakeo, Bout Chakreya, Nissay Chanleakena, and Yi Chheng Eang. For excellent services as an interviewer and translator, we wish to thank Phann Sophy.

We are especially grateful for the exchange and intense discussions with distinguished experts. Among the many contributors, we would like to make particular mention of Dr. Jos Bijman, Associate Professor of Cooperative Organisations at Wageningen University for his invaluable comments on the report. Ralf Arning and Margret Will, who are outstanding resource persons with regard to the organization of agricultural cooperatives in the developing world; Andreas Grötschel from Kamya Agritrade for his understanding of the private sector; and Dr. Philipp Marder from IDS Sussex for his insights into the dynamics of the microfinance sector.

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Fortunately, throughout the entire process, Henrice Stöbesand was there for us as a backstopper. We are thankful for her critical thinking, feedback, improving and editing, valuable advice, contacts, and inspiring us with a film evening and literature for Cambodia. Thank you very much for your passion and work.

IV Acknowledgements

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Finally, our biggest thanks go to the countless participants in our village workshops, interviews, and household survey in rural Cambodia for their patience and openness.

Executive Summary

This study was supported by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and its Improving Livelihoods and Food Security in Cambodia I and II projects (ILF). The ILF is active in five Cambodian provinces and supports poor and formerly landless families who received social land concessions (SLC) from the government.

Under the Khmer Rouge regime, private land property was abolished and the consequences for land registry and land tenure are still felt today through persistent legal uncertainties. To help those in need secure land ownership, the Cambodian government grants SLCs under an interim land policy. Since 2014, the GIZ has supported this process on the community level through the project Improvement of Livelihoods and Food Security (ILF I and II).

The ILF was established to 1) improve food security, 2) develop a basis for long-term agricultural production, and 3) stimulate local development through new partnerships between local authorities and stakeholders in civil society and the private sector.

The promotion and support of agricultural cooperatives (ACs) is part of the project's portfolio. However, to date, evidence on and analysis of the ACs' impact on their members' food security and livelihoods does not exist. This study strives to close this knowledge gap. Two Cambodian ACs served as focal points: the Aukorkei Agricultural Cooperative (AAC) in Kratie province and the Sen Akphiwat Samaki Agricultural Cooperative (SASAC) in Kampong Thom province.

The study was conducted between June and December 2020. As the COVID-19 pandemic made it impossible to travel, the process of data collection was organized remotely, primarily by setting up and steering local research teams in Cambodia from Berlin.

I Hypothesis and Objectives

We hypothesized that successful business operations and a high degree of social inclusiveness within ACs, as well as the usage and dissemination of local agricultural knowledge contribute to the autonomous and sustainable functioning of these ACs. Therefore, our objective was a thorough assessment of three inter-related fields:

→ the contributions of the cooperatives to the livelihoods and food security of their members' households,
→ issues of social inclusion and participation in both ACs, and
→ the usage and exchange of local knowledge in the ILF target communities.

II Methodology

The primary research units were the AAC and the SASAC cooperatives. The period of investigation covered developments since 2010, when the villages Dar and Tipou were founded. Data were collected in September and October 2020 mainly in the provinces of Kratie and Kampong Thom.

The COVID-19 pandemic posed completely new challenges for field research and data collection. As we were unable to travel and collect data ourselves, we set up and steered local research teams.

The main methodologies employed in this study were a household survey (HSS), a Participatory Rural Appraisal (PRA), and key informant interviews (KIIs). We describe each in turn below.

Household Survey

A standardized questionnaire was devised based on literature research and expert interviews. Field testing was conducted and the survey was revised before roll out to 239 respondents between 5 and 11 October 2020. The survey was digitalized using the KoBo Toolbox platform which supports computer-assisted personal interviewing (CAPI). When analyzing the survey results, we used propensity score matching (PSM) to assess the effect of cooperative membership on livelihood and food security. PSM allows direct statistical comparison of AC member households and non-members who are similar in observable characteristics while avoiding selection bias.

Participatory Rural Appraisal (PRA)

The study team also used methods from the toolbox of Participatory Rural Appraisal (PRA). We merged the Method for Impact Assessment of Programs and Projects (MAPP) with the Participatory Livelihood System Analysis (PaLSA). In addition, a Venn diagram was used to derive recommendations for supporting and promoting the exchange and dissemination of local agricultural knowledge. SWOT analyses were conducted with representatives of each of the two agricultural cooperatives.

Key Informant Interviews

Additionally, we held a total of 20 key informant interviews with representatives from ministries, the GIZ, the private sector, NGOs, and ACs, commune chiefs, and recipients of SLCs. The interviews were semi-structured around a guideline. Transcripts were written for all interviews. The software MAXQDA allowed for efficient coding and digital assignment of categories to the statements.

III Results

AC Structure and Services

The AAC has 80 registered members and the SASAC has 94. Both ACs have a Board of Directors (BoD) and a supervisory committee. The positions within the ACs are honorary posts.

For both ACs, contract farming constitutes a core element of their services. Thereby, the land recipients can market their products via the ACs to contracted buyers. Contract farming arrangements exist primarily for cassava, cashew, black and white sesame, and mung beans.

Both ACs also provide services to members and non-members to facilitate organic cultivation, certification, and marketing of cassava, black and white sesame, mung beans and cashews to meet EU and US organic standards. The organic production is monitored by both external inspectors and the ACs' own control systems.

The ACs provide training to their members and three of four respondents[1] said they attended at least one training in the previous twelve months. Most surveyed AC members stated that AC membership has improved their access to agricultural training, though some participants criticized the quality of trainings.

The ACs offer agricultural equipment rental services to members and non-members and around 67 % of the surveyed households claimed they have used this service since joining a cooperative, though some criticized the quality and upkeep of the equipment.

AC members receive agricultural inputs such as fodder, fertilizer, and seeds for agricultural production. Fertilizer and seeds are primarily provided by the GIZ.

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[1] We use the terms "respondents" or "households" to refer to the entire sample, i.e. members and non-members.

AC Member Asset Endowments

AC members' ability and willingness to effectively participate in AC programing in agriculture is governed by their environment, their households' asset endowment, and their livelihood preferences. By gaining a deeper understanding of AC members' asset endowments (social and human assets, natural assets, financial assets, and physical assets), we revealed pre-conditions and factors that led to the adoption and rejection of ACs' innovations and programs.

Regarding social and human assets, MAPP workshop participants ranked *family* as one of their most important livelihood factors. Family members help with field work and support relatives with remittances.

While only one in five AC members never attended school, this is true for more than one third of non-members, indicating that farmers with more years of schooling are more likely to join an AC.

The primary natural asset that SLC recipients claim is, of course, land. In Kratie, the average SLC size was around 1.0 hectare and in Kampong Thom, 2.2 hectares due to differences in the SLC process. Around 70 % of the non-members cultivated their land in the twelve months before data collection and 90 % of the AC members did. Though access to irrigation water has improved as a result of canal and pond construction in Kratie, less than 10 % of both members and non-members claim to have year-round access to irrigation water there. Only 1 % of non-members and 21 % of members in Kampong Thom has access to irrigation water.

In our analysis of physical assets, we noted a similar trend: cooperative members more often own vehicles or smartphones than non-members. They also have better housing, with non-members more often practicing open defecation as a result of lack of appropriate facility at home than members (35 % and 24 %). Members more often own a flush toilet connected to a septic tank than non-members (58 % and 44 %). This has a strong and measurable impact on the health status of these rural communities.

Much attention was given to households' financial assets. 80 % of the respondents generate part of their income through crop cultivation, with AC members generating more agricultural income than non-members. By farming one's own land, the villagers are self-employed and depend less on wage labor. Our interviews confirm that this is generally considered an advantage.

A high percentage of households also generate additional income through sources other than self-employment in agriculture (95–100 %), with paid labor in agriculture, small and medium enterprises or businesses, and construction work

being common jobs and a more significant income source for AC members than non-members. Other livelihood strategies such as internal migration or wage labor of household members often complement farming activities and contribute a major share of the household income.

The total mean and median incomes generated from agriculture are significantly higher for members than for non-members. After applying PSM, the net agricultural income of cooperative members ($527 U.S. dollars) remains significantly higher than non-members ($218 U.S. dollars). Also, the total income of members is higher than for non-members. When looking at the income quintiles of AC members and non-members, the majority of AC members are in the fourth (23 %) and fifth (26 %) quintile, whilst non-members are in the first, second, and third quintile. Still, 16 % of all AC members also belong to the lowest income quintile.

PSM, Agricultural Income by AC Membership and Province

Variable	Total Sample		Kratie		Kampong Thom	
	Non-Member	Member	Non-Member	Member	Non-Member	Member
Net agricultural income (USD)	218 ± 115	527±115**	199 ± 80	390 ± 80**	293 ± 264	716 ± 264*
Total income (USD)	3005 ± 1115	4708 ± 1115*	2762 ± 1614	4301 ± 1614	3113 ± 1556	5004 ± 1556

Note: n = 206, Kratie n = 117, Kampong Thom n = 85. Means are calculated average treatment effects on the treated (ATTs). Cooperative members are compared with non-members within regions using a t-test, *, **, and *** indicate 0.10, 0.05, and 0.01 significance levels.

The calculated average treatment effects on the treated (ATTs) are consistent over the different matching techniques, which is an indication of the robustness of the PSM estimates.

Gross agricultural income is significantly correlated to the cashew and cassava harvests, but is not correlated with the rice harvest since rice is not usually a cash crop. 46 % of the variation in gross agricultural income across the entire sample can be explained solely by cashew and cassava production. In most cases, cassava and cashew are sold through contract farming schemes via the ACs. Under these

agreements, organic crop cultivation is required. Organic farming is not perceived as beneficial by all farmers, mainly because it is highly labor intensive.

Food Security of AC Members and Non-Members

The Food Insecurity Experience Scale (FIES) indicates that the prevalence of moderate or severe food insecurity for AC members is 15 %, compared to 24 % for non-members. The prevalence of severe food insecurity is 0.2 % for members and 0.5 % for non-members.

The HSS indicates that respondents who have home gardens consumed more types of food than respondents without home gardens. 85 % of the respondents with home gardens could relate their dietary diversity with their home gardens.

Social Inclusion

33 % of the responding members in Kratie and 31 % of the responding members in Kampong Thom stated they take part in AC meetings regularly. A much higher rate (86 %) indicated they attend the annual general assembly. 80 % of the AC members confirmed their participation in decision-making processes and 83 % of the AC members agreed that the decisions taken by the cooperative generally represent their personal needs.

When we asked former AC members for their reasons for disengagement from the AC, 52 % stated they left as a result of lack of time. Other reasons supplied were *no benefits* (19 %), *member fees* (13 %), and *negative experiences* (10 %). Organic farming, as it is promoted by the ACs, is often seen as an obstacle to membership, because it is perceived to be arduous and labor and cost intensive. This is an entrance barrier for households with low workforce (with few, young, or disabled members).

Exchange of Local Knowledge

The data show members and non-members receive new knowledge from four main sources: word-of-mouth through friends, relatives, and the ACs and written information from the ACs.

In addition to these four main sources, participants also mentioned exchange visits, development agencies, and the internet. Exchange visits to other communities and to model farmers' plots are highly appreciated by AC members, as were development agencies as knowledge providers. Apart from the GIZ and NGOs, the Department of Agriculture, Forestry and Fisheries provides agricultural extension services, training, workshops, and other forums in the communities.

While internet appears to be easily accessible for many participants, it is only relevant to those who are literate, have smartphones, and have an affinity for social media. AC members are more likely to have access to a smartphone (62 %) than non-members (53 %). Using social media and other means of digital communication could improve communication between farmers and the cooperative.

IV Discussion

The minority of land recipients relies on self-employment in agriculture as their primary income source; however, monetary income only measures the marketed portion of their production. Many of their activities, e.g., the cultivation of paddy rice, are carried out for subsistence purposes. Subsistence production still plays a central role for rural livelihoods and its important function should not be overlooked when promoting cash crops. To *do no harm*, cash crops should be promoted complementary to the existing subsistence production and should not replace it.

Six of ten households claimed to carry out paid labor in agriculture, making this the most common income-generating activity. This raises the question of why land recipients do not focus more on self-employment in agriculture. The shift from paid labor to self-employment in agriculture on one's own land is often facilitated by the AC and generally perceived as positive.

As the effects of climate change pose a major threat to rain-fed agriculture, land recipients rightly do not focus their livelihood strategies solely on agriculture. With an average of two to three income sources, the household strategy of diversifying income sources—particularly internal migration—is primarily understood as a mitigation strategy to lower the risks of agricultural income loss.

To ensure that agriculture becomes a safe and reliable source of income for land recipients, it is important that GIZ's support measures are not yet phased out. Many of the land recipients are currently in the investment phase (a particularly crucial phase for cashew growers) in their planning for long-term income and, thus, food security.

Impacts of AC Activities on Members' Livelihoods and Food Security

Membership in an AC has substantial positive effects on income as shown by our quantitative analysis using PSM. We will discuss which aspects of AC membership contribute most to observable differences in income.

The AC's contract farming arrangements follow an intermediary model. Due to the larger sales volume and stronger bargaining position that can be realized collectively, the ACs can achieve higher sales prices. Both ACs have signed contract farming agreements for organically grown cashews, cassava, mung beans, and sesame. However, the evaluation of the two latter contract farming arrangements exceeds the scope of this study as they are carried out in other provinces.

Almost half of the households surveyed (46 %) were involved in the cultivation of organic cashews, though most farmers have only recently planted their trees and have not yet harvested marketable yields and, thus, 30% are currently experiencing negative agricultural net income as a result of their initial investments. Well-established cashew farmers are among the households reporting the highest annual agricultural incomes ($2,213 U.S. dollars) or four times more than the average income for AC-member households. The production of a highly profitable perennial crop such as cashews has proven to be a successful approach to long-term income generation. We therefore recommend GIZ's continued support of cashew cultivation.

Like cashews, organic cassava is sold directly to intermediary ACs. 85 % of cassava farmers are generating agricultural profits and, in Katie, 30 % of their agricultural income comes from cassava. The cultivation of cassava, thus, seems to be a model of success.

According to the GIZ ILF project team, certified organic production by approximately 800 members in the ILF target communities is a positive development. Growing worldwide demand and 20 to 25 % premiums for organic products provide financial incentives to organic systems which preserve the soil and other natural resources. Nevertheless, many smallholder farmers perceive organic farming's cost–benefit ratio as insufficient and households with less available labor are reluctant to adopt this labor-intensive production system. In addition to the well-functioning internal and external monitoring systems to encourage adherence to contract requirements, which both ACs claim to have, it is essential that farmers become aware of the long-term economic and environmental benefits of sustainable cultivation techniques while receiving short-term tangible benefits from their labor and investments.

Since 2014, there has been a clear trend toward increasing debt in ILF target communities. Though the percentage of indebted households is relatively stable (≈70 %), the average household debt increased from $374 U.S. dollars in 2014/15 to $2,060 U.S. dollars in 2020. AC members hold significantly higher debt than non-members, have more stable and higher incomes from agriculture, and may take

higher risks in investments. A close monitoring of the target households' indebtedness should accompany supportive measures offered to the land recipients by the ACs.

AC-member households are more food secure than non-member households. This may be due to the larger proportion of AC-member households generating income through agricultural and non-agricultural sources. Around 85 % of the respondents claimed they have eaten more diverse diets since they started home gardening, but we were not able to quantify the effect of home gardens on food security as almost all land recipients own a home garden and there was no significant difference between members and non-members in this regard.While income from home gardens is not substantial ($24 to $28 U.S. dollars annually), the CFAP representative and literature (e.g. Galhena et al., 2013; Weinberger, 2013) suggest home gardens increase food security.

Social inclusion

The disaggregation of members and non-members according to total annual household income quintiles has shown that more AC members belong to the fourth (23 %) and fifth quintile (26 %), whilst only 34 % have below average income. This indicates that AC members are better off within the SLC communities.

Most AC members said the ACs' decisions correspond to their personal needs, which indicates that the processes of alignment and voting work. Nevertheless, dissatisfaction exists due to information gaps and divergent opinions. AC representatives should encourage members to voice their concerns by creating a space of open and safe participatory dialog. Participation in decision-making processes is vital for common understanding. Inclusion of all members in decision-making promotes equity, builds democratic structures, and must be non-discriminatory in terms of race, ethnicity, class, and gender.

To improve social inclusion in ACs, poor farmers should be supported while checking barriers and incentives to accessing ACs. Subsidizing initial investments in permanent crops with high investment costs like cashews could remove a barrier to membership.

13 % of all members left the AC as a result of membership fees. To improve members' understanding of this financial burden, the rationale behind, and the correct use of the fee needs to be communicated when advertising AC membership.

Exchange of Local Knowledge

Local knowledge is knowledge that people in a community developed over time and adapted continuously to a changing local culture and environment. The immediate social environment, especially including relatives, friends, and neighbors, remains one of the most important and most easily accessible information sources. Open discussions about how knowledge can be enriched through a symbiosis of both existing and innovative knowledge is crucial to strengthening people's livelihoods. Agricultural cooperatives can contribute to that exchange as intermediaries that foster discussion and disseminate good practices widely.

New needs-based, locally adapted platforms for the exchange of local knowledge could accommodate inter- and intra-community as well as inter-generational exchange and may include exchange visits and integration of regional organizations.

It may also include digitalization to improve communication, "get closer" to its members, improve administrative processes, and improve efficiency. ACs may need to be supported to meet both the technical resources and technical skills to administer digital communications.

Autonomous und Sustainable Operation of ACs

Strengthening AC management and administration is currently the most crucial factor for the success of the ACs. Recruitment of an (external) professional may produce more effective AC management. External assistance with recruitment will curtail bias and nepotism from local power structures. It is expected that profits from contract farming activities will finance this paid position and a strategy to strengthen the ACs' financial status should be considered.

Contract farming of organic products gives farmers access to external and international markets, reduces transaction costs, and mitigates the risks of price fluctuations. Product certification constitutes a key element for market access and, therefore, requires an effective control system. A clear business plan based on comprehensive cost–benefit calculations needs to be developed for organic production of high-value commercial crops.

Proactive networking and alliance building with local private and public partners fosters vertical integration and bundles capacities. The subscription of goods and services from local partners decreases dependency from donor agencies and fosters the integration of local economic networks. Moreover, frequent exchange

with local, regional, and national authorities can better integrate the ACs' position in governmental development programs.

V Conclusion

In our study context, income from self-employment in agriculture is only a minor part of the total household income. Instead, livelihoods are rather diversified with households deriving most of their annual income from agriculture (self-employment and paid work).

ACs have a strong and significant effect on their members' agricultural income. On average, the 137 AC-member households earned about $300 U.S. dollars annually from self-employment in agriculture and thus twice as much as their neighbors who were not AC members. The higher agricultural incomes are primarily the result of contract farming of organic cassava and cashews.

It can be expected that cashew production will generate substantial income for farmers and ACs in the near future. These additional revenues may finance paid key positions within the ACs. Capacity development or the hiring of suitable, well-trained people who can take on leadership roles within the cooperatives would be a major step toward their independence and autonomy. Regarding social inclusion, motivating poorer households to participate is important. More transparency in the rationale behind and use of membership fees is necessary when advertising AC membership among disadvantaged households.

Organic cultivation should stay on the agenda and be further promoted. It became apparent that there is still a widespread refusal of organic farming techniques among the land recipients. Conventional cultivation methods are perceived as less labor intensive, more cost saving, and more profitable than organic alternatives. A detailed cost–benefit analysis of organic farming must be conducted and discussed with land recipients.

ACs can act as intermediaries in the exchange of local knowledge. With their resources, they can introduce innovative ideas, foster discussions among community members, and make good practices available to a wide range of farmers. Among AC members, almost two thirds of the households already own a smartphone and affinity to social networks is high. Social media could be a target-oriented and suitable means of knowledge dissemination for the ACs.

In brief, our recommendations can be summarized as follows:

- GIZ and BMZ should ensure continuous support to the ACs and develop an exit strategy for the medium turn.
- Enhance the potential of contract farming.
- Combine strategies to simultaneously address cash crop and subsistence production.
- Promote local credit and loan services.
- Promote capacities for processing products along the value chain.
- Further promote home gardens.
- Provide customized trainings and coaching to the AC.
- Strengthen social inclusion and increase members' participation.
- Promote viable formats for platforms for the exchange of local knowledge.

សង្ខេបប្រតិបត្តិ

ការសិក្សាស្រាវជ្រាវមួយនេះទទួលបានការគាំទ្រពីអង្គការ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) និងគម្រោងផ្នាល់របស់អង្គការដែលមានឈ្មោះថា *គម្រោងកែលម្អជីវភាពនិងសន្តិសុខស្បៀងនៅកម្ពុជា* (*Improving Livelihoods and Food Security in Cambodia* (*ILF*))។ គម្រោង ILF កំពុងប្រតិបត្តិការក្នុងបណ្តាខេត្តចំនួន ៥ នៅកម្ពុជានិងផ្តល់ការគាំទ្រដល់គ្រួសារគ្មានដីនិង គ្រួសារដែលមានដីតិចដោយគ្រួសារទាំងនោះទទួលបានដីសម្បទានសង្គមកិច្ចពីរដ្ឋាភិបាល។

ក្រោមរបបខ្មែរក្រហម ទ្រព្យសម្បត្តិដីធ្លីឯកជនត្រូវបានលុបចោលទាំងស្រុងហើយបានបន្សល់ទុកផលវិបាកជាច្រើននៅក្នុងការចុះបញ្ជីដីធ្លីនិងសិទ្ធិកាន់កាប់ដីធ្លីរហូតមកដល់សព្វថ្ងៃ ក្រោមរូបភាពនៃភាពស្រពេចស្រពិលខាងផ្លូវច្បាប់។ ដើម្បីធានាថាក្នុងចំណោមជនទីទំលក្រអាចទទួលបានសិទ្ធិកាន់កាប់ដីធ្លី ទើបរដ្ឋាភិបាលកម្ពុជាបានចាប់អនុវត្តគោលនយោបាយដីធ្លីបណ្តោះអាសន្នមួយក្នុងការធ្វើប្រទានកម្ម សម្បទានដីសង្គមកិច្ច (SLC)។ អង្គការ GIZ បានបន្តគាំទ្រដល់ដំណើរការនេះអស់រយៈពេលយូរមកហើយ និងជាមួយគម្រោង ILF នៅក្នុងកម្រិតសហគមន៍ចាប់តាំងពីឆ្នាំ២០១៤។ គម្រោង ILF ត្រូវបានបង្កើតឡើងដើម្បីលើកកម្ពស់សន្តិសុខស្បៀង បង្កើតមូលដ្ឋានកសិផលិតកម្មរយៈពេលវែង និងដើម្បីជម្រុញការអភិវឌ្ឍក្នុងមូលដ្ឋាន។

ការលើកស្ទួយនិងគាំទ្ររបស់សហគមន៍កសិកម្ម (ACs) គឺជាផ្នែកនៃផលប៉ះត្រូវរបស់គម្រោង។ ទោះជាយ៉ាងនេះក្តី ក៏រហូតមកដល់ពេលបច្ចុប្បន្ននេះនៅមិនទាន់មានកស្តុតាងគ្រប់គ្រាន់អំពីឥទ្ធិពលរបស់សហគមន៍កសិកម្ម ទៅលើសន្តិសុខស្បៀងនិងជីវភាពរស់នៅរបស់សមាជិកសហគមន៍នៅឡើយ។ ការសិក្សានេះព្យាយាមបំពេញនូវចន្លោះខ្វះខាតផ្នែកចំណេះដឹងមួយនេះ។ យើងផ្តោតការយកចិត្តទុកដាក់លើសហគមន៍កសិកម្មនៅកម្ពុជាចំនួនពីរ៖ សហគមន៍កសិកម្មអូរគគីរ (AAC) នៅខេត្តក្រចេះ និង សហគមន៍កសិកម្មសែនអភិវឌ្ឍន៍សាមគ្គី (SASAC) នៅខេត្តកំពង់ធំ។

ការសិក្សានេះត្រូវបានធ្វើឡើងនៅចន្លោះខែមិថុនានិងខែធ្នូ ឆ្នាំ២០២០។ ដោយសារការឆ្លងរាតត្បាតនៃជំងឺកូវីដ១៩ ធ្វើឲ្យក្រុមការងារយើងមិនអាចធ្វើដំណើរបាន ទើបដំណើរការនៃការប្រមូលទិន្នន័យត្រូវបានរៀបចំឡើងពីចម្ងាយ ដែលភាគច្រើនតាមរយៈការបង្កើតនិងដឹកនាំក្រុមការងារស្រាវជ្រាវក្នុងស្រុកពីទីក្រុងប៉ៃកឡាំង។

១. *សម្មតិកម្មនិងគោលបំណង*

យើងបានធ្វើសម្មតិកម្មថាប្រតិបត្តិការអាជីវកម្មដែលជោគជ័យនិងបរិយាប័ន្នសង្គមក្នុងកម្រិតខ្ពស់មួយរបស់ សហគមន៍កសិកម្ម ក៏ដូចជាការប្រើប្រាស់ និង ការផ្សព្វផ្សាយចំណេះដឹងកសិកម្មក្នុងមូលដ្ឋានគឺជាបច្ច័យរួមចំណែកដល់ការបំញ្ចេញមុខងារស្វយ័តនិងប្រកបដោយចីរភាពរបស់សហគមន៍កសិកម្មទាំងនេះ។ ដោយហេតុដូច្នេះ ទើបយើងមានគោលបំណងធ្វើការវាយតម្លៃលើចំណុចដែលមានអន្តរទំនាក់ទំនងនឹងគ្នាចំនួនបីគឺ៖

→ ការរួមចំណែករបស់សហគមន៍ចំពោះជីវភាពរស់នៅនិងសន្តិសុខស្បៀងរបស់គ្រួសារជាសមាជិកសហគមន៍
→ បញ្ហាផ្សេងៗនៃបរិយាប័ន្នសង្គមនិងការចូលរួមក្នុងសហគមន៍កសិកម្មទាំងពីរ ព្រមទាំង
→ ការប្រើប្រាស់និងការផ្លាស់ប្តូរចំណេះដឹងក្នុងមូលដ្ឋានតាមបណ្តាសហគមន៍គោលដៅរបស់គម្រោង ILF ។

២. *វិធីសាស្ត្រស្រាវជ្រាវ*

អង្គភាពសំខាន់សម្រាប់ធ្វើការស្រាវជ្រាវគឺសហគមន៍កសិកម្ម AAC និង SASAC។ អំឡុងពេលនៃការអង្កេតមានវិសាលភាពគ្របដណ្តប់លើដំណើរវិវត្តតាំងពីឆ្នាំ២០១០ នៅពេលដែលភូមិដារនិងភូមិទីពេបានលេចចេញជារូបរាងដោយសារការបែងចែកដីសម្បទានសង្គមកិច្ច (SLCs)។ យើងបានធ្វើការប្រមូលទិន្នន័យក្នុងខែកញ្ញានិងខែតុលា ឆ្នាំ២០២០ ភាគច្រើននៅខេត្តក្រចេះនិងខេត្តកំពង់ធំ។

ការឆ្លងរាតត្បាតនៃជំងឺកូវីដ១៩ បង្កឲ្យមានបញ្ហាប្រឈមថ្មីៗមិនធ្លាប់មានសម្រាប់ការសិក្សាស្រាវជ្រាវនិងការប្រមូលទិន្នន័យនៅមូលដ្ឋាន។ ដោយសារតែយើងមិនអាចធ្វើដំណើរចុះទៅប្រមូលទិន្នន័យនៅនឹងកន្លែងដោយផ្ទាល់បាន ទើបយើងត្រូវរៀបចំបង្កើតនិងដឹកនាំក្រុមការងារស្រាវជ្រាវក្នុងស្រុក។

ការអង្កេតតាមខ្នងផ្ទះ

កម្រងសំណួរស្របតាមបទដ្ឋានត្រូវបានបង្កើតឡើងដោយផ្អែកលើការស្រាវជ្រាវទ្រឹស្តីនិងព័ត៌មានបានពីអ្នកជំនាញ។ ការធ្វើសម្ភាសន៍សាកល្បងត្រូវបានអនុវត្តដើម្បីបំភ្លឺរាល់ចំណុចត្រូវកែលម្អដែលចាំបាច់។ ទិន្នន័យត្រូវបានប្រមូលនៅចន្លោះថ្ងៃទី ៥ និង ទី១១ ខែតុលា ឆ្នាំ២០២០។ អ្នកឆ្លើយតបសរុបចំនួន ២៩៣ នាក់ បានចូលរួមក្នុងការអង្កេតតាមខ្នងផ្ទះ។ មានការធ្វើឌីជីថលនីយកម្មលើការអង្កេតនេះដោយប្រើឧបករណ៍ប្រមូលទិន្នន័យតាមទីវាល KoBo Toolbox Platform។

ដើម្បីធ្វើការវាយតម្លៃប្រសិទ្ធភាពសមាជិកភាពរបស់សហគមន៍ជុំវិញបញ្ហាជីវភាពរស់នៅ និង សន្តិសុខស្បៀង យើងបានប្រើវិធីសាស្ត្រ Propensity Score Matching (PSM)។ PSM អាចឲ្យគេធ្វើការប្រៀបធៀបដោយប្រើស្ថិតិរវាងសមាជិក សហគមន៍កសិកម្ម និង អ្នកមិនមែនជាសមាជិកដែលមានចំណុចលក្ខណៈត្រូវស្រាវជ្រាវពាក់ព័ន្ធ ស្រដៀងៗគ្នា។ PSM ស្នើផ្តល់នូវមធ្យោបាយមួយដើម្បីបញ្ចៀសភាពលម្អៀងនៅក្នុងការជ្រើសរើស។

ការវាយតម្លៃជនបទដោយមានការចូលរួម (PRA)

ក្រុមការងារសិក្សាបានប្រើវិធីសាស្ត្រដកស្រង់ចេញពីឧបករណ៍សម្រាប់ការវាយតម្លៃជនបទដោយមានការចូលរួម(PRA)។ យើងបានរួមបញ្ចូល *វិធីសាស្ត្រសម្រាប់ការវាយតម្លៃផលប៉ះពាល់នៃកម្មវិធីនិងគម្រោង* (MAPP) ជាមួយនឹង *ការវិភាគប្រព័ន្ធជីវភាពរស់នៅដោយមានការចូលរួម* (PaLSA)។ លើសពីនេះទៀត Venn-Diagram ត្រូវបានប្រើដើម្បីទាញរកអនុសាសន៍សម្រាប់គាំទ្រនិងលើកកម្ពស់ដល់ការផ្លាស់ប្តូរនិង

ផ្សព្វផ្សាយចំណេះដឹងកសិកម្មក្នុងមូលដ្ឋាន។ មានការរៀបចំធ្វើវិភាគ SWOT ជាមួយតំណាងសហគមន៍កសិកម្មទាំងពីរ ក្នុងគោលបំណងដើម្បីផ្តល់ការវាយតម្លៃសង្ខេបនិងអាចធ្វើដោយខ្លួនឯងបាន។

ការធ្វើសម្ភាសន៍អ្នកផ្តល់ព័ត៌មានសំខាន់

សរុបមក យើងបានធ្វើសម្ភាសន៍អ្នកផ្តល់ព័ត៌មានសំខាន់ចំនួន ២០នាក់ដែលជាតំណាងមកពីបណ្តាក្រសួង អង្គការ GIZ វិស័យឯកជន អង្គការក្រៅរដ្ឋាភិបាល និងសហគមន៍កសិកម្ម ព្រមទាំងមេឃុំនិងអ្នកទទួលបានដីផងដែរ។ ការធ្វើសម្ភាសន៍មានលក្ខណៈពាក់កណ្តាលគ្រោង (semi- structured) និងផ្អែកលើគោលការណ៍ណែនាំ។ រាល់បទសម្ភាសន៍ទាំងអស់សុទ្ធតែមានអត្ថបទចម្លងជាលាយលក្ខអក្សរ ទាំងមួយចប់សេចក្តី ឬ ហោចណាស់តាមផ្នែកដែលពាក់ព័ន្ធ។ កម្មវិធី MAXQDA ផ្តល់លទ្ធភាពដល់ការសរសេរកូដនិងបែងចែកតាមបែបឌីជីថលយ៉ាងមានប្រសិទ្ធភាពនៃចំណាត់ថ្នាក់ផ្សេងៗសម្រាប់របាយការណ៍។

៣. លទ្ធផល

រចនាសម្ព័ន្ធនិងសេវាផ្សេងៗរបស់ AC

AAC *មានសមាជិកចំនួន ៨០នាក់ ហើយ* SASAC *មានសមាជិកចំនួន ៩៤នាក់។* សហគមន៍កសិកម្ម *ទាំងពីរមានក្រុមប្រឹក្សាភិបាលមួយ* (BoD) *និងគណៈកម្មាធិការត្រួតពិនិត្យមួយ។ មុខតំណែងក្នុងគណៈកម្មាធិការ*សហគមន៍កសិកម្ម*គឺត្រូវបានជ្រើសរើសនិងផ្តល់កិត្តិយស។*

*សម្រាប់*សហគមន៍កសិកម្ម *ទាំងពីរ ការធ្វើកសិកម្មតាមកិច្ចសន្យាបង្កើតបានជាធាតុស្នូលនៃសេវាផ្សេងៗរបស់ពួកគេ។ ដោយហេតុនេះទើបអ្នកទទួលបានដីអាចរកទីផ្សារលក់ផលិតផលរបស់ពួកគេ តាមរយៈគណៈកម្មាធិការ*សហគមន៍កសិកម្ម *ទៅឲ្យអ្នកទិញតាមកិច្ចសន្យា។ ការរៀបចំធ្វើកសិកម្មតាមកិច្ចសន្យាមានជាចម្បងសម្រាប់ដំឡូងមី ស្វាយចន្ទី លូខ្មៅនិងលូស និងសណ្តែកខៀវ។*

សហគមន៍កសិកម្ម ទាំងពីរផ្តល់ជូនសេវាផ្សេងៗដើម្បីសម្រួលដល់ការធ្វើវិញ្ញាបនកម្មសរីរាង្គ។ អ្នកទទួលផលមិនត្រឹមតែជាសមាជិក សហគមន៍កសិកម្ម ប៉ុណ្ណោះទេ ប៉ុន្តែក៏ជាអ្នកមិនមែនជាសមាជិកផងដែរ។ បច្ចុប្បន្ននេះ ដំណាំដំឡូងមី លូខ្មៅ លូស សណ្តែកខៀវ និងស្វាយចន្ទីត្រូវបានដាំដុះតាមលក្ខណៈសរីរាង្គ និង លក់ចេញទៅទីផ្សារស្របតាមបទដ្ឋានសហគមន៍អឺរ៉ុបនិងសហរដ្ឋអាមេរិក។ ផលិតកម្មដំណាំសរីរាង្គមានការត្រួតពិនិត្យពីអ្នកត្រួតពិនិត្យខាងក្រៅនិងប្រព័ន្ធត្រួតពិនិត្យផ្ទាល់របស់*គណៈកម្មាធិការ*សហគមន៍កសិកម្ម ថែមទៀត។

ការផ្តល់ការបណ្តុះបណ្តាលកសិកម្មតាមរយៈសហគមន៍កសិកម្មជាទូទៅមានភាពល្អប្រសើរ។ ស្ទើរតែបីនាក់ក្នុងចំណោមអ្នកឆ្លើយតបបួននាក់ (ពាក្យថា "respondents" ឬ "households" យើងសំដៅដល់សំណាកទាំងអស់រួមគ្នាទាំងអ្នកជាសមាជិកនិងអ្នកមិនមែនជាសមាជិក) បាននិយាយថាពួកគេបានចូលរួមតិចបំផុតត្រឹមមួយវគ្គនៅក្នុងរយៈពេល ១២ ខែកន្លងមកនេះ។ សមាជិកសហគមន៍កសិកម្មដែលយើងបានអង្កេតភាគច្រើនបានបញ្ជាក់ថាការទទួលបានការបណ្តុះបណ្តាលផ្នែកកសិកម្មរបស់ខ្លួនមានភាពល្អប្រសើរដោយសារតែពួកគេជាសមាជិករបស់សហគមន៍កសិកម្ម។ ទោះជាដូច្នេះក្តី ក៏សិក្ខាកាមក្នុងសិក្ខាសាលាជាច្រើននាក់បានសម្តែងថាខ្លួនចង់បានការបណ្តុះបណ្តាលដែលមានគុណភាពកាន់តែប្រសើរជាងនេះ។

ប្រមាណ ៦៧% នៃគ្រួសារដែលយើងបានអង្កេតអះអាងថាការទទួលបានគ្រឿងបរិក្ខារកសិកម្មមានការកើនឡើងជាងមុនដោយសារតែពួកគេបានចូលរួមក្នុងសហគមន៍។ ទាំងសមាជិកនិងអ្នកមិនមែនជាសមាជិកអាចរកជាវសេវាថ្លៃឈ្នួលសម្រាប់ត្រាក់ទ័រនិងម៉ាស៊ីនបូមទឹកបាន។ អ្នកផ្តល់សម្ភាសន៍ជាច្រើនបានរិះគន់គុណភាពមិនល្អរបស់គ្រឿងបរិក្ខារទាំងនោះដែលចាំបាច់ត្រូវជួសជុលជាប្រចាំ។

សមាជិកសហគមន៍កសិកម្មទទួលបានធាតុចូលកសិកម្មដូចជាចំណីសត្វ ជីកសិកម្ម គ្រាប់ពូជ ឬមើមដំណាំសម្រាប់ផលិតកម្មកសិកម្មរបស់ពួកគេ។ ជីកសិកម្មនិងគ្រាប់ពូជផ្សេងៗភាគច្រើនត្រូវបានផ្តល់ជូនដោយអង្គការ GIZ។

ធនជានមនុស្សនិងសង្គម

សិក្ខាកាមមកពីសិក្ខាសាលា MAPP បានចាត់ថ្នាក់ *គ្រួសារ* ថាជាកត្តាមួយនៃកត្តាជីវភាពរស់នៅដ៏សំខាន់បំផុតរបស់ពួកគេ។ សមាជិកគ្រួសារមិនត្រឹមតែជួយការងារនៅស្រែចម្ការប៉ុណ្ណោះទេ ប៉ុន្តែថែមទាំងជួយផ្គត់ផ្គង់ដោយការផ្ញើប្រាក់មកសាច់ញាតិរបស់ខ្លួនទៀតផង។

ខណៈដែលមានតែម្នាក់ក្នុងចំណោមសមាជិក AC ៥នាក់មិនបានចូលសាលា (២០%) សេចក្តីដដែលនេះមានពិតប្រាកដចំពោះអ្នកមិនមែនជាសមាជិកច្រើនជាងមួយភាគបី (៣៤%)។ ដោយសារការអប់រំមិនអាស្រ័យលើសមាជិកភាពរបស់ AC ទើបសេចក្តីត្រង់នេះបង្ហាញថាកសិករដែលមានការអប់រំយូរឆ្នាំទំនងជានឹងចូលរួមក្នុងសហគមន៍កសិកម្ម។

ធនជានពីធម្មជាតិ

នៅខេត្តក្រចេះ ទំហំដីសង្គមកិច្ចជាមធ្យមមានប្រមាណតែ ១ ហិកតា និង នៅខេត្តកំពង់ធំមានប្រមាណជា ២,២ ហិកតាព្រោះតែភាពខុសៗគ្នានៃទីតាំងដីសង្គមកិច្ច។ មានប្រមាណតែ ៧០% នៃអ្នកមិនមែនជាសមាជិកប៉ុណ្ណោះបានធ្វើអាជីវកម្មទាញយកប្រយោជន៍ពីដីរបស់ខ្លួនក្នុងរយៈពេល ១២ ខែកន្លងទៅ នៅមុនពេលចុះប្រមូលទិន្នន័យ ប៉ុន្តែសម្រាប់សមាជិកសហគមន៍កសិកម្មវិញមានដល់ទៅ ៩០%។

នៅខេត្តក្រចេះ តិចជាង១០% នៃសមាជិកនិងអ្នកមិនមែនជាសមាជិកបានអះអាងថាមានលទ្ធភាពរកបានប្រព័ន្ធទឹកស្រោចស្រពសម្រាប់ពេញមួយឆ្នាំ។ នៅខេត្តកំពង់ធំ អ្នកមិនមែនជាសមាជិកត្រឹមតែ ១% ប៉ុណ្ណោះអះអាងថាមានលទ្ធភាពរកបានប្រព័ន្ធទឹកស្រោចស្រព ខណៈដែលអ្នកជាសមាជិកស្ទើរតែ ២១% អាចរកបាន។ ជាទូទៅ ការរកបានទឹកសម្រាប់ស្រោចស្រពមានភាពល្អប្រសើរទាំងនៅក្នុងខេត្តក្រចេះ ក៏ដូចជានៅខេត្តកំពង់ធំដោយសារតែមានការសាងសង់ប្រឡាយនិងស្រះធំៗជាច្រើន។

ធនជានហិរញ្ញវត្ថុ

៨០% នៃអ្នកឆ្លើយតបបានបង្កើតប្រាក់ចំណូលមួយផ្នែករបស់ខ្លួនពីការដាំដុះដំណាំផ្សេងៗ។ មានទំនាក់ទំនងជាវិជ្ជមានមួយរវាងសមាជិកភាពសហគមន៍កសិកម្មនិងលទ្ធភាពរកប្រាក់ចំណូលពីកសិកម្ម។ តាមរយៈការធ្វើកសិកម្មលើដីជាកម្មសិទ្ធិផ្ទាល់របស់ខ្លួន អ្នកភូមិជាច្រើនធ្វើការឲ្យខ្លួនឯង ដោយឯករាជ្យ ហើយពួកគេពឹងផ្អែកកាន់តែតិចលើថ្លៃឈ្នួលពលកម្ម។ ការធ្វើសម្ភាសន៍ជាច្រើនរបស់យើងបានបញ្ជាក់ច្បាស់ថាជាទូទៅគេបានចាត់ទុកសេចក្តីត្រង់នេះថាជាគុណសម្បត្តិមួយ។

ភាគរយខ្ពស់នៃគ្រួសារនៅក្នុងខេត្តទាំងពីររកបានប្រាក់ចំណូលបន្ថែម តាមរយៈប្រភពផ្សេងៗក្រៅពីរបរកសិកម្មផ្ទាល់ខ្លួន (៩៥ ទៅ ១០០%)។ ប្រភពចំណូលសំខាន់ផ្សេងទៀតគឺថ្លៃឈ្នួលពលកម្មពីការងារកសិកម្ម សហគ្រាសឬស្ថាប័នជំនួញធុនតូចនិងមធ្យម និងការងារសំណង់។ យុទ្ធសាស្ត្រសម្រាប់ប្រកបរបរចិញ្ចឹមជីវិតផ្សេងទៀតដូចជាការធ្វើចំណាកស្រុកក្នុងប្រទេស ឬ ថ្លៃឈ្នួលពលកម្មរបស់សមាជិកគ្រួសារ ជារឿយៗច្រើនជួយបំពេញបន្ថែមលើសកម្មភាពកសិកម្មហើយរួមចំណែកយ៉ាងសំខាន់ដល់ប្រាក់ចំណូលក្នុងគ្រួសារ។

មធ្យោបាយរួមនិងប្រាក់ចំណូលកម្រិតមធ្យម (median incomes) ដែលបានមកពីកសិកម្មសម្រាប់សមាជិកមានខ្ពស់គួរឲ្យកត់សម្គាល់ធៀបនឹងអ្នកមិនមែនជាសមាជិក។ លើសពីនេះទៀត គ្រួសារជាសមាជិកសហគមន៍រកប្រាក់ចំណូលពីប្រភពមិនមែនកសិកម្មបានច្រើនជាងអ្នកមិនមែនជាសមាជិក ដែលនាំឲ្យគេមានប្រាក់ចំណូលសរុបខ្ពស់ជាង។ ចំពោះសំណាកទាំងមូលក្នុងចំណោម ២៩៣ គ្រួសារ មានចំនួន ៦១ គ្រួសារត្រូវគេរាយការណ៍ថាមានប្រាក់ចំណូលអវិជ្ជមានក្នុងរយៈពេល ១២ ខែចុងក្រោយ។

បន្ទាប់ពីអនុវត្ត PSM ចំណូលកសិកម្មសុទ្ធរបស់សមាជិកសហគមន៍ (៥២៧ដុល្លារ) នៅតែខ្ពស់ជាងបើធៀបនឹងអ្នកមិនមែនជាសមាជិក (២១៨ដុល្លារ)។ ដូចគ្នានេះផងដែរ ប្រាក់ចំណូលសរុបរបស់សមាជិកមានចំនួនខ្ពស់ជាងអ្នកមិនមែនជាសមាជិក។

PSM *ប្រាក់ចំណូលកសិកម្មតាមសមាជិកភាពសហគមន៍កសិកម្មនិងតាមខេត្ត*

អថេរ	សំណាកសរុប		ខេត្តក្រចេះ		ខេត្តកំពង់ធំ	
	អ្នកមិនមែនជាសមាជិក	សមាជិក	អ្នកមិនមែនជាសមាជិក	សមាជិក	អ្នកមិនមែនជាសមាជិក	សមាជិក
ប្រាក់ចំណូលកសិកម្ម (USD)	218 ± 115	527 ± 115**	199 ± 80	390 ± 80**	293 ± 264	716 ± 264*
ប្រាក់ចំណូលសរុប (USD)	3005 ± 1115	4708 ± 1115*	2762 ± 1614	4301 ± 1614	3113 ± 1556	5004 ± 1556

ប្រភព៖ ការគណនាដោយខ្លួនឯង

ប្រាក់ចំណូលដុលពីកសិកម្មមានទំនាក់ទំនងខ្លាំងទៅនឹងបរិមាណស្វាយចន្ទីនិងដំឡូងមីដែលបានប្រមូលផល ប៉ុន្តែមិនទាក់ទងគ្នានឹងបរិមាណស្រូវបានប្រមូលផលនោះទេ។ ៤៦% នៃភាពខុសគ្នារបស់ប្រាក់ចំណូលកសិកម្មដុលក្នុងសំណាកទាំងអស់អាចត្រូវស្រាយបំភ្លឺទៅបានចំពោះតែផលិតកម្មស្វាយចន្ទី និងដំឡូងមី ប៉ុណ្ណោះ។

ករណីភាគច្រើន ដំឡូងមីនិងស្វាយចន្ទីត្រូវបានលក់តាមផែនការធ្វើកសិកម្មតាមកិច្ចសន្យាតាមរយៈសហគមន៍កសិកម្ម។ ក្នុងកិច្ចព្រមព្រៀង ដំណាំទាំងអស់ត្រូវតែដាំដុះតាមបែបសរីរាង្គ។ កសិករទាំងអស់

សុទ្ធតែយល់ឃើញថាការធ្វើកសិកម្មសរីរាង្គមិនសូវទទួលបានអត្ថប្រយោជន៍ច្រើននោះទេ ព្រោះតែត្រូវការប្រើកម្លាំងពលកម្មច្រើនជាពិសេស។

ទ្រព្យរូបវ័ន្ត

សមាជិកសហគមន៍មានយានជំនិះឬទូរសព្ទស្មាតហ្វូនច្រើនជាងអ្នកមិនមែនជាសមាជិក។ ចំពោះការមាន ម៉ូតូ ឡាន និងទូរសព្ទស្មាតហ្វូននេះគឺជាភាពខុសគ្នាដែលគួរឲ្យកត់សម្គាល់មួយ។

អ្នកមិនមែនជាសមាជិកមានទម្លាប់បន្ទោរបង់ពាសវាលពាសកាលញឹកញាប់ជាងសមាជិក (៣៥ និង ២៤% រៀងគ្នា)។ ផ្ទុយទៅវិញ អ្នកជាសមាជិកមានបង្គន់ចាក់ទឹកតភ្ជាប់នឹងអាងទទួលទឹកសំអុយច្រើនជាងអ្នកមិនមែនសមាជិក (៥៨% និង ៤៤% រៀងគ្នា)។ ទិន្នន័យរបស់យើងស្នើថាទម្លាប់បន្ទោរបង់ពាសវាលពាសកាលបង្កឲ្យមានផលប៉ះពាល់ខ្លាំងនិងអាចវាស់វែងបានទៅលើស្ថានភាពសុខភាពរបស់សហគមន៍ជនបទ។

បរិយាប័ន្នសង្គម

៣៣% នៃសមាជិកបានឆ្លើយតបនៅក្នុងខេត្តក្រចេះ និង ៣១% នៃសមាជិកបានឆ្លើយតបនៅខេត្តកំពង់ធំបានលើកឡើងថាខ្លួនបានចូលរួមក្នុងការប្រជុំរបស់សហគមន៍កសិកម្ម ជាប្រចាំ។ អត្រាខ្ពស់ជាងនេះ (៨៦%) បង្ហាញថាពួកគេបានចូលរួមមហាសន្និបាតប្រចាំឆ្នាំ។ ៨០% នៃសមាជិកសហគមន៍កសិកម្មបញ្ជាក់ថាបានចូលរួមក្នុងដំណើរការធ្វើសេចក្តីសម្រេចចិត្ត ហើយ ៨៣% នៃសមាជិកបានឯកភាពថាការសម្រេចចិត្តធ្វើឡើងដោយសហគមន៍ជាទូទៅបានឆ្លើយតបទៅនឹងសេចក្តីត្រូវការផ្ទាល់ខ្លួនរបស់ពួកគាត់។

នៅពេលយើងសាកសួរអតីតសមាជិកសហគមន៍កសិកម្ម ចំពោះហេតុផលដែលពួកគេត្រូវផ្តាច់ទំនាក់ទំនងពីសហគមន៍ មាន ៥២% និយាយថាបានចាកចេញពីសហគមន៍កសិកម្ម ដោយសារមិនមានពេលគ្រប់គ្រាន់។ ហេតុផលផ្សេងទៀតដែលត្រូវចាកចេញពីសហគមន៍កសិកម្មនោះគឺ៖ "គ្មានអត្ថប្រយោជន៍" (ចំនួន ១៩%) "ថ្លៃសមាជិកភាព" (ចំនួន ១៣%) និង "បទពិសោធអវិជ្ជមាន" (ចំនួន ១០%)។

ការធ្វើកសិកម្មសរីរាង្គដូចបានជម្រុញនិងលើកកម្ពស់ដោយសហគមន៍កសិកម្មត្រូវបានកសិករមើលឃើញថាជាឧបសគ្គសម្រាប់ការចូលជាសមាជិកសហគមន៍ពីព្រោះគេយល់ឃើញថាលំបាកខ្លាំងពេក ត្រូវការប្រើកម្លាំងពលកម្មច្រើនហើយចំណាយក៏ច្រើន។ នេះគឺជារបាំងក្នុងការចូលជាសមាជិកសម្រាប់គ្រួសារដែលមានកម្លាំងពលកម្មតិចតួច (មានសមាជិកតិច មានវ័យក្មេងពេក ឬមានសមាជិកជាជនមានពិការភាព)។

បើក្រឡេកមើលចំណែកនៅក្នុងក្រុមបញ្ចភាគចំណូល (income quintiles) របស់សមាជិកសហគមន៍កសិកម្ម និងអ្នកមិនមែនជាសមាជិក ផ្នែកធំជាងគេបង្អស់របស់សមាជិកត្រូវគេរកឃើញថាស្ថិតនៅក្នុងបញ្ចភាគទីបួន (២៣%) និងទី៥ (២៦%) ខណៈដែលអ្នកមិនមែនជាសមាជិកបែរជាស្ថិតក្នុងបញ្ចភាគទីមួយ ទីពីរ និង ទីបីទៅវិញ។ ទោះយ៉ាងនេះក្តី ក៏មាន ១៦% នៃសមាជិកសហគមន៍កសិកម្មទាំងអស់ស្ថិតក្នុងបញ្ចភាគចំណូលទាបបំផុតផងដែរ។

ការផ្លាស់ប្តូរចំណេះដឹងក្នុងតំបន់

ការប្រមូលទិន្នន័យបានរកឃើញប្រភពចំណេះដឹងកសិកម្មជាច្រើន។ ប្រភពព័ត៌មានសំខាន់បំផុតចំនួនបួន (សមាជិកនិងអ្នកមិនមែនជាសមាជិក) នោះគឺប្រភពនៃការនិយាយតគ្នាពីមិត្តភក្តិ សាច់ញាតិ និងសហគមន៍ ប៉ុន្តែក៏មានព័ត៌មានជាលាយលក្ខអក្សរចេញពីសហគមន៍ផងដែរ។ សម្រាប់សមាជិកសហគមន៍កសិកម្មច្បាស់ណាស់ដែលថាសហគមន៍កសិកម្ម គឺជាប្រភពចំណេះដឹងសំខាន់បំផុត រីឯអ្នកមិនមែនជាសមាជិកវិញសហគមន៍នៅតែជាប់ទាក់ទង ប៉ុន្តែស្ថិតក្នុងកម្រិតប្រហាក់ប្រហែលគ្នានឹងមិត្តភក្តិនិងសាច់ញាតិដែរ។

ការចុះទស្សនកិច្ចសិក្សាទៅកាន់សហគមន៍ដទៃដើម្បីផ្លាស់ប្តូរបទពិសោធន៍ទៅវិញទៅមកទទួលបានការឲ្យតម្លៃខ្ពស់ក្នុងចំណោមសមាជិកសហគមន៍កសិកម្ម ។ ប្រព័ន្ធមួយដែលគេហៅថាកសិករគំរូនោះ អាចបំពេញបន្ថែមនូវការផ្លាស់ប្តូរចំណេះដឹងនេះបន្តដល់សមាជិក។

សិក្ខាសាលាទាំងអស់បានបង្ហាញឲ្យឃើញពីសារៈសំខាន់នៃភ្នាក់ងារអភិវឌ្ឍន៍នៅក្នុងការផ្តល់ចំណេះដឹង។ ក្រៅពីអង្គការ GIZ និងបណ្តា NGOs ខាងមន្ទីរកសិកម្ម រុក្ខាប្រមាញ់និងនេសាទបានរៀបចំបង្កើតសេវាផ្សព្វផ្សាយកសិកម្ម (agriculture extension services) វគ្គបណ្តុះបណ្តាល សិក្ខាសាលា និងវេទិកាជាច្រើនផ្សេងទៀតនៅក្នុងសហគមន៍។

អ៊ីនធឺណិតហាក់ដូចជាងាយស្រួលរកប្រើសម្រាប់សិក្ខាកាមជាច្រើននាក់នៅក្នុងសិក្ខាសាលា។ សិក្ខាកាមបានប្រាប់បន្ថែមទៀតថាអ៊ីនធឺណិតមានប្រយោជន៍សម្រាប់តែអ្នកចេះអក្សរ អ្នកមានទូរសព្ទស្មាតហ្វូន និងអ្នកមានចំណូលចិត្តចំពោះបណ្តាញសង្គមប៉ុណ្ណោះ។ សមាជិកសហគមន៍កសិកម្ម ទំនងជាមានលទ្ធភាពប្រើប្រាស់ទូរសព្ទស្មាតហ្វូន (៦២%) ជាងអ្នកមិនមែនជាសមាជិក (៥៣%)។ តំណាងសហគមន៍កសិកម្មក៏ដូចជាសមាជិកបានបង្ហាញថាការប្រើប្រាស់បណ្តាញសង្គមនិងមធ្យោបាយទំនាក់ទំនងឌីជីថលផ្សេងទៀតអាចធ្វើឲ្យទំនាក់ទំនងរវាងកសិករ និង សហគមន៍មានភាពល្អប្រសើរជាងនេះ។ ទោះយ៉ាងណា សហគមន៍កសិកម្មក្នុងខេត្តទាំងពីរនៅមិនទាន់មានផែនការជាក់លាក់អំពីរបៀបប្រើប្រាស់នូវប្រពន្ធឌីជីថលទៅលើការងាររបស់ពួកគាត់នៅឡើយ។

៤. ការពិភាក្សា

មួយចំនួនតូចនៃអ្នកទទួលបានដីប៉ុណ្ណោះដែលមានរបរកសិកម្មដោយខ្លួនឯងជាប្រភពចំណូលចម្បង ប៉ុន្តែប្រាក់ចំណូលរូបិយវត្ថុត្រឹមអាចវាស់ស្ទង់ចំណែកដែលមានទីផ្សារស្រាប់របស់ផលិតកម្មតែប៉ុណ្ណោះ។ សកម្មភាពភាគច្រើនដូចជាការដាំដុះដំណាំស្រូវត្រូវបានគេធ្វើជាចម្បងសម្រាប់គោលបំណង**បរិភោគ**។វាច្បាស់ណាស់ដែលថាផលិតកម្មសម្រាប់បរិភោគនៅតែជើរតួសំខាន់ខ្លាំងសម្រាប់ជីវភាពរស់នៅរបស់ប្រជាកសិកររនៅតំបន់គោលដៅហើយមុខងារដ៏សំខាន់មួយនេះមិនគួរត្រូវបានគេមើលរំលងនៅពេលធ្វើការជម្រុញការដាំដំណាំលក់យកប្រាក់នោះឡើយ។ ដើម្បី "មិនបង្កផលប៉ះពាល់" ដំណាំលក់យកប្រាក់ឬដំណាំពាណិជ្ជកម្មគួរត្រូវជម្រុញឲ្យមានការដាំដុះដើម្បីបង្រួបបន្ថែមលើផលិតកម្មសម្រាប់បរិភោគដែលមានស្រាប់ហើយមិនគួរធ្វើជំនួសទាំងស្រុងនោះទេ។

គ្រួសារចំនួន ៦ ក្នុងចំណោម ១០គ្រួសារបានអះអាងថាបានរកប្រាក់ពីថ្លៃឈ្នួលពលកម្មក្នុងវិស័យកសិកម្មដែលធ្វើឲ្យសកម្មភាពនេះក្លាយជាសកម្មភាពបង្កើតប្រាក់ចំណូលពេញនិយមបំផុតមួយ។ ត្រង់នេះនាំឲ្យមានជាចម្ងល់ថា**ហេតុអ្វីបានជាអ្នកទទួលបានដីមិនផ្តោតការយកចិត្តទុកដាក់ទៅលើការធ្វើកសិកម្មឲ្យខ្លួនឯងច្រើនជាងនេះ**។ ការប្តូរពីលក់ពលកម្មទៅធ្វើកសិកម្មឲ្យខ្លួនឯងនៅលើដីផ្ទាល់ខ្លួនត្រូវបានសម្របសម្រួលដោយក្រុមប្រឹក្សាសហគមន៍កសិកម្ម ហើយត្រូវបានគេយល់ថាមានលក្ខណៈវិជ្ជមាន។ ហេតុដូច្នេះទោះជាស្ថានភាពកសិកម្មជាក់ស្តែងនៅតែត្រូវកំណត់លក្ខណៈដោយអតុល្យភាពខ្លាំងរវាងការធ្វើការឲ្យខ្លួនឯង និង ថ្លៃឈ្នួលពល-កម្មក៏ដោយ ក៏ស្ថានភាពនេះមានភាពល្អប្រសើរជាងមុនហើយគួរតែមានការត្រួតពិនិត្យឲ្យបានជិតដល់ដើម្បីវាយតម្លៃផលប៉ះពាល់របស់សហគមន៍កសិកម្មទៅលើការការប្រកបរបរចិញ្ចឹមជីវិតរបស់សមាជិកខ្លួន។

ឥទ្ធិពលបម្រែបម្រួលជាតុអាកាសបង្កការគំរាមកំហែងយ៉ាងខ្លាំងដល់កសិកម្មដែលពឹងលើទឹកភ្លៀង។ ផ្ទុយគ្នានឹងសាវតានេះ គេហាក់ដូចជាអាចយល់បានថាអ្នកទទួលបានដីជាច្រើនមិនបានផ្តោតយុទ្ធសាស្ត្រប្រកបរបរចិញ្ចឹមជីវិតរបស់ខ្លួនឲ្យខ្លាំងពេកទៅលើកសិកម្មនោះទេ។ ដោយសារមានប្រភពចំណូលជាមធ្យមពី ២ ទៅ ៣ ផ្សេងពីគ្នា ទើបយុទ្ធសាស្ត្ររបស់គ្រួសារនៅក្នុងការរកប្រាក់ចំណូលពីប្រភពផ្សេងពីគ្នា ពិសេសការធ្វើចំណាកស្រុកក្នុងប្រទេស ត្រូវគេសន្មតថាជាយុទ្ធសាស្ត្រសម្រាល និង កាត់បន្ថយហានិភ័យនានាពីការខាតបង់ប្រាក់ចំណូលកសិកម្ម។ អ្នកទទួលបានដីជាច្រើនបានសាង**ភាពធន់**ទុកស្រេចនៅក្នុងការស្វែងរកយុទ្ធសាស្ត្រចិញ្ចឹមជីវិតប្លែកពីគ្នា ហើយត្រូវបន្តធ្វើដូច្នេះសម្រាប់ពេលខាងមុខទៀត។

ដើម្បីជានាឲ្យបានថាកសិកម្មនឹងក្លាយទៅជាប្រភពប្រាក់ចំណូលមួយដែលមានសុវត្ថិភាពនិងអាចពឹងផ្អែកបានសម្រាប់អ្នកទទួលដី សំខាន់ណាស់ដែលថា**វិធានការណ៍គាំទ្រមួយចំនួននឹងមិនឈានដល់ទីបញ្ចប់**។ ចំណុចនេះមានសារៈសំខាន់ជាងពេលណាៗទាំងអស់ ដោយសារថាអ្នកទទួលបានដីភាគច្រើនកំពុងស្ថិតក្នុងដំណាក់កាលវិនិយោគដ៏សំខាន់សម្រាប់ជីវិត (ពិសេសលើស្វាយចន្ទី) ដែលនឹងអាចទទួលជោគជ័យក្នុងការរកប្រាក់ចំណូលដ៏ក្រាស់ក្រែលយូរអង្វែង ដែលជាហេតុនាំឲ្យមានសន្តិសុខស្បៀង។

ផលប៉ះពាល់របស់សហគមន៍កសិកម្មលើជីវភាពរស់នៅនិងសន្តិសុខស្បៀងរបស់សមាជិក

សមាជិកភាពរបស់សហគមន៍កសិកម្មមួយក្នុងចំណោមសហគមន៍ទាំងពីរ ពិតជាមានឥទ្ធិពលវិជ្ជមានទៅលើប្រាក់ចំណូល ដូចបានបង្ហាញនៅក្នុងការវិភាគបែបបរិមាណរបស់យើងដោយប្រើ PSM។ ប្រាក់ចំណូលកសិកម្មរបស់សមាជិកសហគមន៍កសិកម្ម មានច្រើនគួរឲ្យកត់សម្គាល់លើសពីប្រាក់ចំណូលកសិកម្មរបស់អ្នកមិនមែនជាសមាជិក។ ដើម្បីបង្ហាញថាកត្តាណាមួយនៃសមាជិកភាពរបស់សហគមន៍កសិកម្មបានរួមចំណែកដល់ភាពខុសគ្នានៃប្រាក់ចំណូលដែលជាកត្តាសំខាន់ក្នុងការធានាជីវភាពរស់នៅគ្រប់គ្រាន់និងបង្កើនសន្តិសុខស្បៀង យើងនឹងលើកយកចំណុចសំខាន់ៗមកពិភាក្សាដូចខាងក្រោម។

ការរៀបចំ**ធ្វើកសិកម្មតាមកិច្ចសន្យា**របស់*គណៈកម្មាធិការ*សហគមន៍កសិកម្មទាំងពីរធ្វើឡើងតាមគំរូអន្តរការី៖ កសិករលក់ផលិតផលកសិកម្មសរីរាង្គរបស់ពួកគេដោយផ្ទាល់ឲ្យទៅសហគមន៍កសិកម្ម នឹងធ្វើការលក់ផលិតផលបន្តក្នុងបរិមាណនិងគុណភាពដែលមានបញ្ជាក់លក្ខណៈច្បាស់ តាមកាលបរិច្ឆេទកំណត់ទៅឲ្យ

ក្រុមហ៊ុនដែលបានចុះកិច្ចសន្យា។ ដោយហេតុដូច្នេះទើបអាចទទួលបាននូវតម្លៃលក់ខ្ពស់។ ការព្រមព្រៀងកសិកម្មតាមកិច្ចសន្យាត្រូវចុះហត្ថលេខាសម្រាប់ដំណាំស្វាយចន្ទី ដំឡូងមី សណ្តែកខៀវ និងល្ងដែលសុទ្ធតែត្រូវបានដាំដុះតាមលក្ខណៈសរីរាង្គ។ ទោះយ៉ាងណា ការវាយតម្លៃលើការរៀបចំកសិកម្មតាមកិច្ចសន្យានៅលើកក្រោយទៀត មានទំហំធំហួសពីវិសាលភាពនៃការសិក្សានេះ ដោយសារតែមានការអនុវត្តក្នុងបណ្តាខេត្តដទៃៗទៀត។ការដាំដុះ**ស្វាយចន្ទីសរីរាង្គ**ដើរតួនាទីយ៉ាងសំខាន់សម្រាប់សហគមន៍គោលដៅរបស់គម្រោង ILF។ ស្ទើរជិតពាក់កណ្តាលនៃគ្រួសារដែលយើងបានអង្កេត (៤៦%) បានចូលរួមដាំដុះដំណាំស្វាយចន្ទីថ្វីបើមានតិចតួចប៉ុណ្ណោះបានកំពុងលក់ចេញទៅហើយក្តី។ សេចក្តីត្រង់នេះអាចត្រូវពន្យល់តាមការពិតដែលថាកសិករភាគច្រើនទើបតែចាប់ផ្តើមដាំកូនដើមស្វាយចន្ទីនាពេលថ្មីៗនេះប៉ុណ្ណោះ។ ដូច្នេះ ពួកគាត់កំពុងរង់ចាំលទ្ធផលលើកដំបូងដែលគាត់រំពឹងថារឿនបំផុតទាល់តែនៅបីឆ្នាំក្រោយឯណោះ។ លើសពីនេះ ការផលិតស្វាយចន្ទីទាមទារឲ្យមានការវិនិយោគច្រើន។ បច្ចុប្បន្ន កសិករផលិតស្វាយចន្ទី ៣០% កំពុងកត់បញ្ជីប្រាក់ចំណូលអវិជ្ជមានពីកសិកម្មដោយសារតែការវិនិយោគរបស់ពួកគេ។ ប៉ុន្តែ កសិករទាំងឡាយដែលប្រឡូកក្នុងផលិតកម្មស្វាយចន្ទីរួចស្រេចទៅហើយនោះស្ថិតក្នុងចំណោមគ្រួសារដែលមានប្រាក់ចំណូលកសិកម្មខ្ពស់បំផុត។ ប្រាក់ចំណូលសុទ្ធពីកសិកម្មប្រចាំឆ្នាំជាមធ្យមរបស់ពួកគេគឺ ២.២១៣ដុល្លារ ខ្ពស់ជាង៤ដងនៃតម្លៃមធ្យមសម្រាប់គ្រួសារជាសមាជិកសហគមន៍កសិកម្ម ។ ការផលិតដំណាំមានអាយុកាលវែង (perennial crop) ដែលមានផលចំណេញខ្ពស់ដូចជាស្វាយចន្ទី បង្ហាញឲ្យឃើញថាជាវិធីសាស្ត្រដោគជ័យមួយសម្រាប់ការបង្កើតប្រាក់ចំណូលរយៈពេលវែង។ ដូច្នេះទើបយើងសូមផ្តល់អនុសាសន៍ឲ្យធ្វើការពិចារណាលើការបន្តផ្តល់ហិរញ្ញប្បទានដល់ការដាំដុះស្វាយចន្ទី យ៉ាងហោចដល់កសិករភាគច្រើនបានចាប់ផ្តើមផលិតរួច។

ដូចគ្នានឹងស្វាយចន្ទីដែរ **ដំឡូងមីសរីរាង្គ** ត្រូវបានលក់ផ្តាល់ឲ្យទៅអន្តរការីសហគមន៍កសិកម្ម។ នៅខេត្តក្រចេះប្រមាណជា ៣០% នៃប្រាក់ចំណូលកសិកម្មរបស់គ្រួសារទាំងអស់បានមកពីការដាំដុះដំឡូងមី។ ប្រសិនបើយើងក្រឡេកទៅមើលទិន្នផលនិងប្រាក់ចំណេញរបស់កសិករដាំដំឡូងមីវិញ មានភស្តុតាងបង្ហាញច្បាស់ថាមានតែ ៧% ក្នុងចំណោមពួកគេប៉ុណ្ណោះដែលរងការខាតបង់ផ្នែកកសិកម្ម។ ផ្ទុយទៅវិញ កសិករដាំដំឡូងមី ចំនួន ៨៥ % កំពុង រកបានប្រាក់ចំណេញពីកសិកម្មទាំងមូលរបស់ខ្លួន ថ្វីបើពួកគេខ្លះកំពុងវិនិយោគលើស្វាយចន្ទីក៏ដោយក្តី។ ដូច្នេះការដាំដុះដំឡូងមីហាក់ដូចជាគំរូនៃភាពជោគជ័យមួយអញ្ចឹងដែរ។

រហូតមកដល់ពេលនេះ **ផលិតកម្មសរីរាង្គមានវិញ្ញាបនប័ត្រ** ដែលមានសមាជិកប្រមាណ ៨០០នាក់ មកពីសហគមន៍គោលដៅរបស់គម្រោង ILF អាចត្រូវចាត់ទុកថាជាគំរូជោគជ័យមួយ។ ថ្វីបើដូច្នេះក្តី ក្នុងចំណោមកសិករខ្នាតតូចហាក់ដូចជានៅតែមានការឲ្យតម្លៃទាបលើបច្ចេកទេសដាំដុះបែបសរីរាង្គនៅឡើយ។ កសិករជាច្រើនយល់ឃើញថាសមាមាត្របន្ទុកចំណាយនិងផលចំណេញនៃកសិកម្មសរីរាង្គនៅមិនទាន់អាចទ្រទ្រង់បាន។ ដូចបានរៀបរាប់ខាងដើម កសិកម្មសរីរាង្គពឹងផ្អែកខ្លាំងទៅលើកម្លាំងពលកម្មរហូតដល់កម្រិតមួយដែលគ្រួសារទាំងឡាយដែលមានកម្លាំងពលកម្មតិចមិនបានចូលរួម។ បញ្ហាដដែលមួយនៃសកម្មភាពសមូហភាពក្នុងផលិតកម្មសរីរាង្គកើតឡើងនៅពេលដែលកសិកររើរើវិធីសាស្ត្រតាមទម្លាប់ ហើយមិនអើពើនឹងលក្ខខណ្ឌតម្រូវក្នុងកិច្ចសន្យាសម្រាប់កសិកម្មសរីរាង្គ។ ក្រៅពីប្រព័ន្ធត្រួតពិនិត្យផ្ទៃក្នុងនិងខាងក្រៅដែលមានដំណើរការល្អដូចសហគមន៍កសិកម្ម ទាំងពីរអះអាងថាខ្លួនមាននោះ ចាំបាច់ណាស់ដែលកសិកត្រូវយល់ដឹងអំពីអត្ថប្រយោជន៍សេដ្ឋកិច្ចរបស់បច្ចេកទេសដាំដុះប្រកបដោយចីរភាពរយៈពេលយូរអង្វែង។ បន្ថែមលើទស្សនៈវិស័យនៃកំណើនខាងតម្រូវការផលិតផលសរីរាង្គនៅលើទីផ្សារពិភពលោកនិងបុព្វលាភចាប់ពី ២០ ទៅ

២៥ % សម្រាប់ផលិតផល សរីរាង្គនោះ បច្ចេកទេសបែបសរីរាង្គក៏ជួយការពារដីនិងធនធានធម្មជាតិផ្សេងៗទៀតផងដែរ។ ជាលទ្ធផល កិច្ចការនេះធ្វើឲ្យមានភាពល្អប្រសើរនូវទស្សន:វិស័យរយៈពេលវែងសម្រាប់កសិកម្មនៅកម្ពុជា។

មាននិន្នាការជាក់ច្បាស់មួយដែលនាំឆ្ពោះទៅរក**ការកើនឡើងនៃបំណុល**ក្នុងបណ្តាសហគមន៍គោលដៅរបស់គម្រោង ILF គិតតាំងពីឆ្នាំ២០១៤មក។ ទោះបីជាភាគរយនៃគ្រួសារជំពាក់បំណុលមានចំនួនថេរប្រមាណជា ៧០% ក៏ដោយ ក៏បរិមាណទឹកប្រាក់បំណុលជាមធ្យមបានកើនឡើង៖ ក្នុងចន្លោះឆ្នាំ ២០១៤/២០១៥ បំណុលជាមធ្យមតាមគ្រួសារមានប្រមាណជា ៣៧៤ដុល្លារ ខណៈដែលទិន្នន័យយើងបានប៉ាន់ប្រមាណឃើញថាបរិមាណទឹកប្រាក់នេះកើនឡើងគុណនឹងបួនរហូតដល់ ២.០៦០ដុល្លារ។ ចំណែកតូចមួយប៉ុន្តែមានការកើនឡើងក្នុងចំណោមគ្រួសារទាំងអស់ ចាំបាច់ត្រូវចាប់ផ្តើមយកកម្ចីឥណទានដើម្បីសងបំណុលចាស់ (២-៣% នៃអ្នកជាប់កម្ចីឥណទានក្នុងឆ្នាំ ២០១៦ រហូតដល់ ៥% នៅឆ្នាំ ២០២០)។ គ្រួសារទាំងនេះងាយនឹងរងគ្រោះពីភាពជាប់បំណុលហួសប្រមាណនិងរង្វិលជុំបំណុល។ ទិន្នន័យរបស់យើងបានបង្ហាញថាសមាជិកសហគមន៍កសិកម្ម ជាប់បំណុលកម្រិតខ្ពស់គួរឲ្យកត់សម្គាល់ធៀបនឹងអ្នកមិនមែនជាសមាជិក។ ដោយសារសមាជិកមានប្រាក់ចំណូលពីកសិកម្មខ្ពស់ជាងនិងមានស្ថេរភាពជាង ទើបពួកគាត់មានទំនោរហានប្រថុយធ្វើការវិនិយោគខ្លាំងជាង។ ការឃ្លាំមើលយ៉ាងជិតដល់លើភាពជាប់បំណុលរបស់គ្រួសារគោលដៅត្រូវអមដោយវិធានការណ៍គាំទ្រសម្រាប់អ្នកទទួលបានដី។ នៅពេលដែលផ្នែកប្រជាជនកាន់តែធំត្រូវបង្ខំចិត្តចូលទៅក្នុងរង្វិលជុំបំណុល នោះ បណ្តាទីភ្នាក់ងារអភិវឌ្ឍន៍នានាគួរ ពិចារណារកវិធានការឆ្លើយតប។ បើមិនដូច្នោះទេ ទាំងកសិករនិងគម្រោងអភិវឌ្ឍន៍នានាអាចប្រឈមនឹងការខាតបង់សមិទ្ធិផលរបស់ខ្លួនសន្សឹមៗ ដោយសារវិស័យមីក្រូហិរញ្ញវត្ថុនៅ កម្ពុជាមានការរីកចម្រើនឥតឈប់ឈរ ហើយបន្សល់ទុកនូវប្រជាជនក្រីក្រគ្មានដីធ្លីរស់នៅ។

គ្រួសារជាសមាជិកសហគមន៍កសិកម្ម ក្នុងគម្រោង ILF ដែលយើងបានអង្កេតមាន**សន្តិសុខស្បៀង**ច្រើនជាងគ្រួសារមិនមែនជាសមាជិក។ នេះអាចបណ្តាលមកពីហេតុផលច្រើនយ៉ាង។ ទីមួយ ផ្នែកធំនៃគ្រួសារជាសមាជិកកំពុងបង្កើតប្រាក់ចំណូលពីកសិកម្ម។ លើសពីនេះទៀត គ្រួសារជាសមាជិកជាច្រើនរកប្រាក់ចំណូលបានច្រើនជាងពីប្រភពមិនមែនកសិកម្មផ្សេងៗ។ ជាទូទៅ សមាជិកសហគមន៍កសិកម្ម មានលទ្ធភាពចាយវាយលើតម្រូវការហូបចុកក្នុងគ្រួសាររបស់ពួកគេបានប្រសើរជាង អញ្ចឹងហើយទើបពួកគេជួបនឹងបញ្ហាអសន្តិសុខស្បៀងក្នុងកម្រិតទាបជាង។

ប្រមាណជា ៨៥% នៃអ្នកឆ្លើយតបបានអះអាងថាពួកគេបានបរិភោគអាហារចម្រុះមុខដោយសារពួកគាត់មានកម្មសិទ្ធិសួនបន្លែលក្ខណៈគ្រួសារ។ យើងមិនអាចធ្វើការវាយតម្លៃចេញជាបរិមាណនៃឥទ្ធិពលរបស់សួនបន្លែលក្ខណៈគ្រួសារទៅលើសន្តិសុខស្បៀងបានទេ ព្រោះអ្នកទទួលបានដីស្ទើរទាំងអស់សុទ្ធតែមានសួនបន្លែលក្ខណៈគ្រួសាររៀងៗខ្លួន ហើយក៏មិនសូវមានលក្ខណៈខុសគ្នាខ្លាំងគួរឲ្យកត់សម្គាល់រវាងសមាជិកនិង អ្នកមិនមែនជាសមាជិកទាក់ទងនឹងចំណុចត្រង់នេះប៉ុន្មានដែរ។ ប៉ុន្តែទិន្នន័យបែបគុណវិស័យ (qualitative data) របស់យើងបង្ហាញថាថ្វីបើប្រាក់ចំណូលពីសួនបន្លែលក្ខណៈគ្រួសារមិនមានច្រើនជាដុំកំភួនក្តី ក៏"*សួនបន្លែ លក្ខណៈគ្រួសារពិតជាបានបង្កើនសន្តិសុខស្បៀងសម្រាប់សហគមន៍ជនបទប្រាកដមែន*"ដូចបានបូកសរុបជូនដោយអ្នកតំណាង CFAP។

បរិយាប័ន្នសង្គម

ការបែងចែកសមាជិកនិងអ្នកមិនមែនជាសមាជិកផ្អែកតាមក្រុមបញ្ចូភាគប្រាក់ចំណូល (ប្រាក់ចំណូលក្នុងគ្រួសារប្រចាំឆ្នាំសរុប) បានបង្ហាញថាសមាជិកសហគមន៍កសិកម្ម កាន់តែច្រើនស្ថិតក្នុងចតុភាគទី៤ (២៣%) និង ទី៥ (២៦%) ខណៈដែលមានតែ ៣៤% ប៉ុណ្ណោះដែលមានប្រាក់ចំណូលក្រោមមធ្យម។ ប្រាក់ចំណូលលើមធ្យមត្រូវនឹង ៥0% នៃសមាជិកសហគមន៍កសិកម្ម ហើយមានតែ ៣១% ប៉ុណ្ណោះនៃអ្នកមិនមែនជាសមាជិក (រូបភាពទី ១៦)។ នេះបង្ហាញឲ្យឃើញថា**សមាជិក**សហគមន៍កសិកម្ម **មានជីវភាពធូរធារ**ក្នុងរង្វង់សហគមន៍ អ្នកទទួលដីសង្គមកិច្ច ទូទៅ។

នេះកើតឡើងស្របពេលជាមួយគ្នានឹងទស្សនៈរបស់ Bizikova et al ដែលបានកំណត់រកឃើញប្រភេទធំៗនៃកត្តាសេដ្ឋកិច្ចសង្គមដែលជះឥទ្ធិពលដល់រចនាសម្ព័ន្ធសមាជិកភាពរបស់អង្គការកសិករ (FO ឆ្នាំ ២០២0)។ សមាជិករបស់ FOs ទំនងជាអាចបញ្ចប់ការសិក្សាថ្នាក់បឋម ឬ ខ្ពស់ជាងនេះ មានសិទ្ធិកាន់កាប់ដីធ្លីទំហំធំជាង និងមានកម្មសិទ្ធិទំនិញបរិមាណច្រើនជាង (យោងតាម ibid ឆ្នាំ២០២0 ទំព័រ ៦២៥)។ ការសិក្សាបានផ្តល់ជាអនុសាសន៍គាំទ្រដល់ប្រជាកសិករក្រីក្រ ស្របពេលជាមួយគ្នានឹងការសម្លឹងមើលឧបសគ្គនិងគ្រឿងលើកទឹកចិត្តដើម្បីទទួលបានសេវា FOs។ ចំពោះករណីរបស់យើងវិញ ការវិនិយោគដំបូងលើដំណាំអាយុកាលវែង (permanent crops) ដូចជាស្វាយចន្ទីមានកម្រិតខ្ពស់។ ការឧបត្ថម្ភធនដល់ការវិនិយោគសម្រាប់សមាជិកជាជនក្រីក្រអាចបន្តយកម្រិតចូលជាសមាជិករបស់សហគមន៍កសិកម្មបាន។

អំឡុងពេលសិក្ខាសាលា PRA សមាជិកសហគមន៍កសិកម្ម (ACs) ភាគច្រើនបាននិយាយថា**ការសម្រេចចិត្ត**របស់ក្រុមប្រឹក្សាសហគមន៍កសិកម្ម បានឆ្លើយតបទៅនឹងតម្រូវការផ្ទាល់ខ្លួនរបស់ពួកគាត់ដែលបង្ហាញឲ្យឃើញច្បាស់ថាដំណើរការនៃការសម្របតាមនិងការងារបោះឆ្នោតមានប្រសិទ្ធភាពហើយ។ ទោះយ៉ាងនេះក្តី ក៏មានលេចឡើងពីការធ្វើសម្ភាសន៍ជាមួយគ្រួសារសមាជិកដែលថាការពេញចិត្តមានការធ្លាក់ចុះ។ តំណាង AC ត្រូវលើកទឹកចិត្តសមាជិកឲ្យកាន់តែខ្លាំងក្នុងការសម្តែងក្តីកង្វល់របស់ពួកគេ ហើយក្នុងពេលដំណាលគ្នានេះដែរ ថ្នាក់ដឹកនាំរបស់សហគមន៍កសិកម្ម គួរត្រូវគេលើកទឹកចិត្តឲ្យប្រើភាសាងាយយល់នៅពេលនិយាយទៅកាន់សមាជិក។ ការចូលរួមក្នុងដំណើរការធ្វើសេចក្តីសម្រេចចិត្តពិតជាមានភាពចាំបាច់ខ្លាំងសម្រាប់ការអធ្យាស្រ័យរវាងគ្នាជាទូទៅ។ ដោយហេតុនេះទើបការរាប់បញ្ចូលសមាជិកគ្រប់ៗរូបទៅក្នុងការធ្វើសេចក្តីសម្រេចចិត្តបានលើកកម្ពស់សមធម៌ បង្កើតរចនាសម្ព័ន្ធប្រជាធិបតេយ្យ ហើយមិនត្រូវមានការរើសអើងចំពោះពូជអម្បូរណ៍ ជាតិសាសន៍ វណ្ណៈ និងយេនឌ័រនោះឡើយ។

១៣% នៃសមាជិកដែលបានចាកចេញពីសហគមន៍កសិកម្ម បានបង្ហាញថា**ថ្លៃសេវាសមាជិកភាព**គឺជាដើមហេតុមួយ។ ហេតុផលនៅពីក្រោយនិងការប្រើថ្លៃសេវាឲ្យបានត្រឹមត្រូវចាំបាច់ត្រូវមានការផ្តល់ព័ត៌មាននៅពេលផ្សព្វផ្សាយអំពីសមាជិកភាពរបស់*គណៈកម្មាធិការ*សហគមន៍កសិកម្មដើម្បីបង្កើនការយល់ដឹងអំពីបន្ទុកហិរញ្ញ-វត្ថុមួយនេះ។

គ្រួសារដែលយើងបានអង្កេតមានមេគ្រួសារច្រើនជាបុរស (សមាជិកមានចំនួន ៧៥% និងមិនមែនជាសមាជិកមាន ៦៧%) ប៉ុន្តែក្នុងបញ្ជីរាយនាមរបស់សហគមន៍កសិកម្ម ភាគច្រើនជាសមាជិកស្ត្រី (៤៧% ក្នុង SASAC និង ៨0% ក្នុង AAC)។ តើអាចទៅរួចដែរទេដែលថា*គណៈកម្មាធិការ*សហគមន៍កសិកម្ម ផ្តល់

ឱកាសក្នុងការ**ផ្តល់សិទ្ធិអំណាចដល់ស្ត្រី** តាមរយៈការទទួលស្គាប់សំលេង ការបណ្តុះបណ្តាល និងឥទ្ធិពលនោះ? បើតាម Ferguson and Kepe (ឆ្នាំ ២០១១) បានទទួលធ្វើការស្រាវជ្រាវលើករណីសិក្សាមួយស្តីអំពីសហគមន៍កសិកម្ម និង ការផ្តល់សិទ្ធិអំណាចសង្គមដល់ស្ត្រីនៅប្រទេសយូហ្គាន់ដា។ ពួកគេបានរកឃើញថាស្ត្រីដែលចូលរួមក្នុងសហគមន៍កសិកម្ម បានបង្កើនទំនុកចិត្ត ជំនាញចរចា សមត្ថភាពក្នុងការបម្រើសហគមន៍របស់ពួកគេតាមរយៈការផ្ទេរជំនាញទៅអ្នកមិនមែនជាសមាជិក និង សមត្ថភាពក្នុងការគ្រប់គ្រងលើការសម្រេចចិត្តក្នុងគ្រួសារជាក់លាក់ (ibid)។

ការផ្លាស់ប្តូរចំណេះដឹងក្នុងមូលដ្ឋាន

យើងកំណត់នយចំណេះដឹងក្នុងមូលដ្ឋានថាជាចំណេះដឹងដែលប្រជាជនក្នុងសហគមន៍ជាក់លាក់មួយបានបង្កើតឡើងពីពេលមួយទៅពេលមួយហើយបានចាប់អនុវត្តបន្តបន្ទាប់តាមបម្រែបម្រួលវប្បធម៌ និងបរិយាកាសក្នុងមូលដ្ឋាន។

មជ្ឈដ្ឋានសង្គមជិតស្និទ្ធនៅតែជា**ប្រភពព័ត៌មាន**ដ៏សំខាន់បំផុតនិងងាយរកបានបំផុតមួយ ពិសេសត្រង់នេះមានរាប់បញ្ចូលទាំងសាច់ញាតិ មិត្តភក្តិ និងអ្នកជិតខាងផងដែរ។ ការពិភាក្សាជាសាធារណៈមួយអំពីរបៀបដែលចំណេះដឹងអាចត្រូវគេធ្វើឲ្យកាន់តែមានខ្លឹមសារ តាមរយៈការចែកចាយរវាងគ្នា ទាំងចំណេះដឹងមានស្រាប់ និងចំណេះដឹងច្នៃប្រឌិតថ្មី ពិតជាមានសារៈសំខាន់ខ្លាំងដើម្បីពង្រឹងការប្រកបរបរចិញ្ចឹមជីវិតរបស់ប្រជាពលរដ្ឋ។ សហគមន៍កសិកម្មអាចរួមចំណែកក្នុងការផ្លាស់ប្តូរចំណេះដឹងទាំងនោះដោយការជើរតួជាអន្តរការី។ ពួកគាត់អាចជ្រោមជ្រែងឲ្យមានការពិភាក្សានិងផ្លាស់ប្តូរចំណេះដឹងក្នុងចំណោមសមាជិកសហគមន៍និងនាំឲ្យមានទម្លាប់ អនុវត្តន៍ល្អៗដល់មនុស្សជាច្រើននាក់។

ការបង្កើត**វេទិកាសម្រាប់ការផ្លាស់ប្តូរ**ចំណេះដឹងថ្មីៗក្នុងមូលដ្ឋានបម្រើដល់អន្តរសហគមន៍ និង ក្នុងរង្វង់សហគមន៍ ក៏ដូចជាដល់ការផ្លាស់ប្តូរចំណេះដឹងអន្តរជំនាន់ផងដែរ។ បែបផែនត្រូវផ្អែកលើតម្រូវការនិងសម្របទៅតាមសមត្ថភាពរបស់អ្នកចូលរួម។ សេចក្តីនេះស្នើឡើងដោយមានទំនោរសំដៅដល់ការផ្លាស់ប្តូរជំណើរទស្សនៈកិច្ចនិងដើម្បីធ្វើសមាហរណកម្មបណ្តាអង្គការក្នុងតំបន់ឲ្យកាន់តែប្រសើរ។ ត្រូវស្នើឲ្យមានការបែងចែកដាច់ស្រឡះពីគ្នានូវលទ្ធភាពទទួលបានការបណ្តុះបណ្តាលសម្រាប់សមាជិកនិងអ្នកមិនមែនជាសមាជិក។

ពាក្យគន្លឹះមួយដែលឧស្សាហ៍លើកឡើងនៅអំឡុងពេលស្រាវជ្រាវរបស់យើងនោះគឺ**ការធ្វើឌីជីថលនីយកម្ម**។ ឧបករណ៍ឌីជីថលមានសក្តានុពលធ្វើឲ្យការទំនាក់ទំនងនិងប្រសិទ្ធភាពការងារមានភាពល្អប្រសើរ។ក្នុងចំណោមសមាជិកសហគមន៍កសិកម្ម ស្ទើរជិត ២ ភាគ ៣ នៃគ្រួសារទាំងអស់មានទូរសព្ទស្មាតហ្វូនមួយគ្រឿងរួចទៅហើយ ហើយអាច រកប្រភពអ៊ីនធឺណិតប្រើប្រាស់យ៉ាងងាយស្រួល។ ទាក់ទងនឹងសក្តានុពលដែលអាចផ្តល់ដោយបច្ចេកវិទ្យាទំនាក់ទំនងព័ត៌មាន (ICT) សហគមន៍កសិកម្មត្រូវនិយោគលើការធ្វើឌីជីថលនីយកម្ម ដើម្បីខិតចូលកាន់តែជិតសមាជិករបស់ខ្លួននិងជាក់បញ្ចូលឧបករណ៍ឌីជីថលផ្សេងៗដើម្បីកែលម្អដំណើរការកិច្ចការរដ្ឋបាលរបស់ពួកគេ។ ត្រង់នេះតម្រូវឲ្យ*គណៈកម្មាធិការ*សហគមន៍កសិកម្មមានទាំងលទ្ធភាពធនធានបច្ចេកទេសក៏ដូចជាជំនាញបច្ចេកទេសដើម្បីអាចគ្រប់គ្រងលើក្រុមបណ្តាញសង្គម ឬ ដើម្បីរៀបចំការប្រជុំតាមអនឡាញទៅបាន។

ប្រតិបត្តិការប្រកបដោយនិរន្តរភាពនិងស្វ័យភាពនៃសហគមន៍កសិកម្ម

សមាជិកសហគមន៍កសិកម្មជាច្រើនកំពុងស្ថិតក្នុងចំណុចសំខាន់ទាក់ទងនឹងការអភិវឌ្ឍលំនាំនៃការដាំដុះរបស់ពួកគាត់ ជាពិសេសទាក់ទងនឹងការដាំដុះស្វាយចន្ទី។ ខណៈនេះ ការរំកិលខ្លួនចេញសន្សឹមៗនៃជំនួយគាំទ្ររបស់គម្រោង ILF អាចនឹងឆាប់ខិតចូលមកដល់ពេក ហើយប្រថុយនឹងការខាតបង់សមិទ្ធផលផ្សេងៗ។ នៅដំណាក់កាលបច្ចុប្បន្នសហគមន៍កសិកម្មគួរតែទទួលបានការគាំទ្រឲ្យបង្កើតយុទ្ធសាស្ត្រមួយថាតើប្រាក់ចំណូលបន្ថែមពីការរំពឹងទុកនៃដំណាំស្វាយចន្ទីអាចនឹងត្រូវប្រើដើម្បីពង្រឹងមូលដ្ឋានហិរញ្ញវត្ថុរបស់ពួកគេបានយ៉ាងដូចម្តេច។ ការពង្រឹងការគ្រប់គ្រងនិងកិច្ចការរដ្ឋបាលគឺជាកត្តាសំខាន់បំផុតសម្រាប់ជោគជ័យរបស់សហ-គមន៍កសិកម្មនាពេលបច្ចុប្បន្ន។ ការជួលអ្នកអាជីព (ពីខាងក្រៅ) អាចជាមធ្យោបាយមួយនាំទៅរកការគ្រប់គ្រងប្រកបដោយប្រសិទ្ធភាព។ ចំពោះដំណើរការជ្រើសរើស*គណៈកម្មាធិការ*សហគមន៍កសិកម្មប្រហែលជាត្រូវការស្នើសុំជំនួយការពីខាងក្រៅដើម្បីបញ្ចៀសឥទ្ធិពលហួសប្រមាណនៃរចនាសម្ព័ន្ធអំណាចនៅថ្នាក់មូលដ្ឋាន។

ការធ្វើកសិកម្មតាមកិច្ចសន្យាលើផលិតផលសរីរាង្គផ្តល់ឱកាសនៅក្នុងការជ្រៀតចូលដល់ទីផ្សារខាងក្រៅនិងសូម្បីតែទីផ្សារអន្តរជាតិ កាត់បន្ថយចំណាយប្រតិបត្តិការ និងបន្ថយហានិភ័យនៃអតិផរណាតម្លៃ។ ការធ្វើវិញ្ញាបនកម្មផលិតផលបង្កើតបានជាធាតុសំខាន់មួយសម្រាប់ជ្រៀតចូលទីផ្សារ ដូច្នេះទើបតម្រូវឲ្យមានប្រព័ន្ធត្រួតពិនិត្យដ៏មានប្រសិទ្ធភាពមួយដើម្បីបំពេញតាមលក្ខខណ្ឌដែលបានឯកភាព។ គេចាំបាច់ត្រូវបង្កើតផែនការអាជីវកម្មច្បាស់លាស់ដែលផ្អែកលើការគណនាបន្ទុកចំណាយនិងផលចំណេញយ៉ាងល្អិតល្អន់សម្រាប់វិស័យទាំងនេះ។

ការកសាងបណ្តាញនិងសម្ព័ន្ធភាពសកម្មមុនជាមួយដៃគូឯកជននិងសាធារណៈក្នុងមូលដ្ឋានជម្រុញល្បឿនការធ្វើសមាហរណកម្មបញ្ឈរ (vertical integration) និងចងជាបណ្តុំសមត្ថភាពផ្សេងៗ។ ការជាវទំនិញ និងសេវាជាប្រចាំពីដៃគូក្នុងមូលដ្ឋានកាត់បន្ថយការពឹងផ្អែកលើទីភ្នាក់ងារផ្តល់ជំនួយ និង ជម្រុញការធ្វើសមាហរណ-កម្មនៃបណ្តាញសេដ្ឋកិច្ចក្នុងមូលដ្ឋាន។ លើសពីនេះ ការផ្តោះប្តូរបានញឹកញាប់ជាមួយអាជ្ញាធរថ្នាក់មូលដ្ឋាន ថ្នាក់តំបន់ និងថ្នាក់ជាតិអាចរួមបញ្ចូលតួនាទីរបស់*គណៈកម្មាធិការ*សហគមន៍កសិកម្មបានកាន់តែប្រសើរជាងមុនទៅក្នុងកម្មវិធីអភិវឌ្ឍន៍នានារបស់រដ្ឋាភិបាល។

៥. សេចក្តីសន្និដ្ឋាន

ក្នុងបរិបទសិក្សារបស់យើង ប្រាក់ចំណូលបានមកពីរបរកសិកម្មធ្វើដោយខ្លួនឯងគ្រាន់តែជាចំណែកតូចមួយនៃប្រាក់ចំណូលសរុបក្នុងគ្រួសារចំពោះករណីភាគច្រើនប៉ុណ្ណោះ។ ផ្ទុយទៅវិញ ការប្រកបរបរចិញ្ចឹមជីវិតមានលក្ខណៈប្លែកៗពីគ្នា។ ទោះយ៉ាងណា គ្រួសាររកប្រាក់ចំណូលប្រចាំឆ្នាំភាគច្រើនរបស់ខ្លួនពីកសិកម្ម (ធ្វើការឲ្យខ្លួនឯងនិងការងារមានថ្លៃឈ្នួល)។

*គណៈកម្មាធិការ*សហគមន៍កសិកម្មក្នុងខេត្តក្រចេះនិងកំពង់ធំមានឥទ្ធិពលខ្លាំងនិងសំខាន់ទៅលើប្រាក់ចំណូលកសិកម្មរបស់សមាជិកពួកគាត់។ ជាមធ្យម គ្រួសារជាសមាជិករបស់សហគមន៍កសិកម្ម ចំនួន ១៣៧ គ្រួសារអាចរកចំណូលបានប្រមាណជា ៣០០ដុល្លារ ពីរបរកសិកម្មផ្ទាល់ខ្លួន ហើយច្រើនជាងពីរដងធៀបនឹងអ្នកជិតខាងរបស់គាត់ដែលមិនបានចូលរួមជាមួយសហគមន៍ណាមួយនោះ។ ប្រាក់ចំណូលខ្ពស់ពីកសិកម្ម

ក្នុងចំណោមសមាជិកនៅសហគមន៍គោលដៅ ភាគច្រើនគឺបានមកពីការធ្វើកសិកម្មតាមកិច្ចសន្យានៃការដាំដុះដំឡូងមីនិងស្វាយចន្ទី។

គេអាចរំពឹងថាផលិតកម្មស្វាយចន្ទីនឹងបង្កើតប្រាក់ចំណូលយ៉ាងក្រាស់ក្រែលនាពេលអនាគតដ៏ខ្លីខាងមុខសម្រាប់កសិករក៏ដូចជាសហគមន៍កសិកម្មផងដែរ។ ប្រាក់ចំណូលបន្ថែមទាំងនេះអាចបង្កើតជាមូលដ្ឋានគ្រឹះសម្រាប់ផ្តល់ហិរញ្ញប្បទានសម្រាប់ទូទាត់ថ្លៃឈ្នួលដល់មុខតំណែងសំខាន់ៗក្នុង*គណៈកម្មាធិការ*សហគមន៍កសិ កម្ម។ បច្ចុប្បន្នការគ្រប់គ្រងរបស់*គណៈកម្មាធិការ*សហគមន៍កសិកម្មធ្វើឡើងដោយឈរលើមូលដ្ឋានស្មគ្រចិត្ត ដែលមានប្រកពភាគច្រើនយល់ឃើញថាជាឧបសគ្គធំមួយសម្រាប់ការអភិវឌ្ឍសហគមន៍កសិកម្ម។

ការអភិវឌ្ឍសមត្ថភាពឬការជួលមនុស្សដែលទទួលបានការបណ្តុះបណ្តាលត្រឹមត្រូវដែលអាចទទួលតួនាទីជាអ្នកដឹកនាំនៅក្នុងសមាគមន៍គួរតែជាជំហានដ៏សំខាន់មួយឆ្ពោះទៅរកឯករាជ្យភាពនិងស្វ័យភាពរបស់សហ-គមន៍។

ការដាំដុះបែបសរីរាង្គគួរតែស្ថិតនៅក្នុងរបៀបវារៈនិងគួរត្រូវមានការផ្សព្វផ្សាយបន្ថែមទៀត។ ជាក់ស្តែងនៅតែមានការបដិសេធទូទៅមិនទទួលយកបច្ចេកទេសកសិកម្មសរីរាង្គក្នុងចំណោមអ្នកទទួលបានដីសម្បទានជាច្រើននាក់។ ពួកគេយល់ឃើញថាវិធីសាស្ត្រដាំដុះតាមទម្លាប់មិនសូវប្រើកម្លាំងពលកម្មច្រើន អាចសន្សំសំចៃថ្លៃចំណាយបានច្រើនជាងនិងមានផលចំណេញច្រើនជាងជម្រើសជំនួសបែបចីរភាព។ អ្នកទទួលដីត្រូវទទួលឥទ្ធិ-ពលវិជ្ជមានជាក់ស្តែងពីការធ្វើកសិកម្មសរីរាង្គដែលគេរំពឹងទុកថានឹងកើតមានភ្លាមៗនៅពេលស្វាយចន្ទីចាប់ផ្តើមចេញផ្លែផ្កា។ ការវិភាគបន្ទុកចំណាយនិងផលចំណេញនៃកសិកម្មសរីរាង្គត្រូវតែមានការរៀបចំធ្វើ និង ពិភាក្សាជាមួយអ្នកទទួលបានដី។

ទាក់ទងនឹងបរិយាប័ន្នសង្គម សំខាន់ណាស់ដែលត្រូវបង្កើនការជម្រុញលើកទឹកចិត្តដល់ផ្នែកប្រជាជនក្រីក្រឲ្យចូលរួម។ តម្លាភាពបន្ថែមទៀតទាក់ទងនឹងឯកសារនិងហេតុផលសមស្របក្នុងការប្រើប្រាស់ថ្លៃសេវាសមាជិកភាពគឺចាំបាច់ធ្វើការផ្សព្វផ្សាយដល់សមាជិករបស់សហគមន៍កសិកម្មក្នុងចំណោមគ្រួសារដែលងាយចាញ់ប្រៀបគេ។

ទាក់ទងនឹងការផ្លាស់ប្តូរចំណេះដឹងក្នុងមូលដ្ឋាន គេអាចសង្ខេបបានថា*គណៈកម្មាធិការ*សហគមន៍កសិកម្មអាចរួមចំណែកដល់ការផ្លាស់ប្តូរក្នុងនាមជាអន្តរការី។ ជាមួយនឹងធនធានដែលមាន ពួកគេអាចណែនាំគំនិតច្នៃប្រឌិតថ្មីៗ ជម្រុញឲ្យមានការពិភាក្សាក្នុងចំណោមសមាជិកសហគមន៍ និងធ្វើឲ្យមានទម្លាប់អនុវត្តន៍ល្អៗដល់កសិករកាន់តែច្រើននាក់។ ក្នុងចំណោមសមាជិកសហគមន៍កសិកម្ម ជិត ២ភាគ៣ នៃគ្រួសារទាំងអស់មាន ទូរសព្ទស្មាតហ្វូន ហើយចំណាប់អារម្មណ៍ប្រើប្រាស់បណ្តាញសង្គមក៏មានកម្រិតខ្ពស់។ បណ្តាញសង្គមអាចជាក្រុមគោលដៅដែលត្រូវតម្រង់ទិសទៅរក និង ជាមធ្យោបាយសមស្របក្នុងការផ្សព្វផ្សាយចំណេះដឹងសម្រាប់ *គណៈកម្មាធិការ*សហគមន៍កសិកម្ម ។

សង្ខេបមក **អនុសាសន៍ផ្សេងៗ** របស់យើងអាចត្រូវបូកសរុបដោយសង្ខេបដូចខាងក្រោម៖

→ អង្គការ GIZ និង BMZ ត្រូវជានាឲ្យមានការគាំទ្រជាបន្តបន្ទាប់ដល់*គណៈកម្មាធិការ*សហគមន៍កសិកម្ម ត្រង់ចំណុចដ៏សំខាន់នេះ និង បង្កើតយុទ្ធសាស្ត្រចាកចេញ (exit-strategy) សម្រាប់រយៈពេលយូរ។

→ បង្កើនសក្តានុពលនៃការធ្វើកសិកម្មតាមកិច្ចសន្យា។
→ បញ្ចូលគ្នានូវយុទ្ធសាស្ត្រផ្សេងៗក្នុងពេលដំណាលគ្នាដើម្បីដោះស្រាយបញ្ហាការដាំដំណាំលក់យកប្រាក់ និងផលិតសម្រាប់បរិភោគ។
→ លើកកម្ពស់សេវាប្រាក់កម្ចីនិងឥណទានក្នុងស្រុក។
→ លើកកម្ពស់សមត្ថភាពសម្រាប់ផលិតផលកែច្នៃតាមខ្សែសង្វាក់តម្លៃ។
→ ជម្រុញឲ្យមានការធ្វើសួនបន្លែលក្ខណៈគ្រួសារបន្ថែមទៀត។
→ ផ្តល់ការបណ្តុះបណ្តាលនិងការបង្វឹកដល់កន្លែងស្របតាមតម្រូវការជូនទៅសហគមន៍កសិកម្ម ។
→ ពង្រឹងបរិយាប័ន្នសង្គមនិងបង្កើនការចូលរួមរបស់សមាជិក។
→ លើកកម្ពស់ទម្រង់ដែលអាចទទួលយកបានសម្រាប់វេទិកាផ្លាស់ប្តូរចំណេះដឹងក្នុងមូលដ្ឋាន។

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Abbreviations

AAC	Aukorkei Agricultural Cooperative, Kratie Province
AC	Agricultural cooperative
ATT	Average treatment effect on the treated
BMZ	German Federal Ministry for Economic Cooperation and Development
BoD	Board of directors
CACC	Cambodian Agriculture Cooperative Corporation, Plc.
CAPI	Computer-assisted personal interviewing
CFAP	Cambodian Farmers Federation Association of Agricultural Producers
COVID-19	Coronavirus disease
DAFF	Department of Agriculture, Forestry and Fisheries, Kingdom of Cambodia
DfID	Department for International Development
DGRV	Deutscher Genossenschafts- und Raiffeisenverband
EcoSan	Ecological sanitation
ELC	Economic land concession
FAO	Food and Agriculture Organization of the United Nations
FIES	Food Insecurity Experience Scale
FSG	Food Security Group
FO	Farmer organization
GDI	German Development Institute
GDP	Gross domestic product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
HDDS	Household Dietary Diversity Score
HDI	Human Development Index (UNDP)
HSS	Household survey
HU	Humboldt Universität zu Berlin
ICA	International Co-operative Alliance
ICT	Information and communication technologies
IHDI	Inequality-adjusted Human Development Index (UNDP)
ILF	Improving Livelihoods and Food Security
KII	Key informant interview
LASED	Land Allocation for Social and Economic Development Project
MAFF	Ministry of Agriculture, Forestry and Fisheries, Kingdom of Cambodia

MAPP	Method for Impact Assessment of Programs and Projects
MFI	Microfinance Institution
MLMUPC	Ministry of Land Management, Urban Planning and Construction
NGO	Nongovernmental organization
Norad	Norwegian Agency for Development Cooperation
OECD	Organization for Economic Co-operation and Development
PaLSA	Participatory Livelihood System Analysis
PRA	Participatory Rural Appraisal
PSM	Propensity score matching
RQ	Research question
SASAC	Sen Akphiwat Samaki Agricultural Cooperative
SDG	Sustainable Development Goal
SLC	Social land concession
SLE	Center for Rural Development (Seminar für Ländliche Entwicklung)
SLF	Sustainable Livelihoods Framework
SoA	Signature of Asia Co. Ltd.
ToR	Terms of reference
UDDT	Urine-diverting dry toilet
UN	United Nations
USAID	United States Agency for International Development
WASH	Water, Sanitation, and Hygiene

1 Introduction

The contemporary situation in Cambodia is to an unusually high degree shaped by the country's recent history. In 1997, a team of Swedish anthropologists investigated community networks in rural Cambodia with the objective of assessing types of rural *"social organization and power structures"* (Ovesen et al., 1996, p. 2). On the existence of local networks and the levels of cooperation in between rural households, the study concluded: "*We have noted the relative absence of formal organizational structures beyond the level of the individual household, and, indeed, beyond the nuclear family… In a formal, organizational sense it may be said that every household is an island*" (p. 69f). Consequently, Ovesen et al. entitled their report "When every household is an island" (a reference to a poem by John Donne).

But things change, and in Cambodia, often at a fast pace. In 2001, just four years after Ovesen et al. published their report, the Cambodian government issued the Royal Decree on Agricultural Cooperatives (Royal Government of Cambodia, Decree NS/RKT/0701/234, 2001) and, thereby, recognized and promoted privately organized forms of rural cooperation as e.g., farmers organizations or agricultural cooperatives (ACs). Thereafter, agricultural cooperatives flourished across rural Cambodia and, by now, at least 850 ACs have been established (Chea, 2010).

Consequently, we chose to title our report "Cooperating out of Poverty?", which is a reference to the study "*Cooperating out of poverty - The renaissance of the African cooperative movement"* published by Patrick Develtere et al. in 2008.

This research has been supported by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) project Improving Livelihoods and Food Security in Cambodia I and II (ILF). With ILF II, the GIZ is currently active in four Cambodian provinces and supports poor and formerly landless families who received a social land concession (SLC) from the Royal Government of Cambodia (GIZ, 2019). The promotion and support of agricultural cooperatives (ACs) is part of the project's portfolio. However, to date, there is a lack of deep insights and robust evidence on the impact of the ACs on their members' food security and sustainable livelihoods. The GIZ mandated the SLE to conduct a study to close this knowledge gap.

Two Cambodian ACs are the focus of this study: the Aukorkei Agricultural Cooperative (AAC) in the commune of Dar, Kratie province and the Sen Akphiwat Samaki Agricultural Cooperative (SASAC) in the commune of Tipou, Kampong

Thom province. Both ACs primarily work with smallholder farmers who received an SLC from the Cambodian government. Both ACs currently partner with the GIZ.

According to the terms of reference (ToR, see Annex 1), this study's mission is a thorough analysis of the *"local main impacts of the ACs"*, in particular on their members' livelihoods and food security, and of the *"main mechanisms of change"*. Another study concern addresses questions of the sustainability and resilience of the ACs structures: *"What happens after the end of support measures, which the ACs still receive and how could they develop sustainably and more independently?"*

The study was conducted between June and December 2020. As the COVID-19 pandemic made travel impossible, data collection was organized remotely primarily by steering local research teams in Cambodia from Berlin.

1.1 Study Background

1.1.1 Social and Economic Background

With a surface of 176,520 km² and roughly 14 million inhabitants, Cambodia is a rather small country in the Southeast Asian region (National Institute of Statistics, 2018). The agriculturally important lowland areas are nevertheless densely populated and arable land is scarce (Hennecke et al., 2018). Most of the Cambodian population lives in rural settings (76.6 %; National Institute of Statistics, 2018) and depends on agricultural income. Agriculture contributes up to 37 % to the Cambodian gross domestic product (GDP; National Institute of Statistics,2013).

Over the last two decades, Cambodia had considerable economic growth rates and since 2015, Cambodia has been classified as a lower-middle income country (World Bank, 2015). Although the country has made substantial progress in poverty reduction in the last 14 years (the number of households classified as "poor" decreased from about 53.2 % in 2004 to 12.9 % in 2018), Cambodia's Human Development Index (HDI) is very low at 0.581 (HDI world = 0.731) and ranked 146 of 189 in 2018 (UNDP, 2019). Additionally, the Inequality-adjusted Human Development Index (IHDI) shows high inequality in the distribution of the HDI indices, with HDI falling to 0.465 after adjustment (UNDP, 2019). 55 % of the Cambodian population are still at risk of dropping below the poverty line (Hennecke et al., 2018) since land access has severely deteriorated in recent years, particularly as approximately three quarters of the growing Cambodian population continue to rely on agricultural income. 29 % of all agrarian families currently own no land at all. 90 % of the poor live in the countryside. The availability of income in the

countryside largely depends on the success of the agricultural year, the climate (risks of drought as well as flooding), and world market prices.

In summary, Cambodia is still at the lower end of middle-income countries in terms of social and economic indicators and the benefits of the economic development primarily materialize in urban settings, thereby increasing inequality and widening urban–rural disparities.

The annual growth rate of urban (n = 715) and rural (n = 2,723) households are both around 1 %, indicating a growing population and increasing demand for land and food. Since 2008, the average household size was stable at 4.6 persons (National Institute of Statistics, 2019), which is below the global average. Every fifth household was headed by a woman in 2017 (National Institute of Statistics, 2018).

Cambodia's low Gender Inequality Index (value 0.474, rank 114 out of 162 countries in 2018) is due to several inequalities. Women earn less than men (women: $2,650 U.S. dollars GDP per capita per annum, men: $3,563; Hennecke et al., 2018), women occupy only 19.3 % of the Cambodian parliamentary seats (UNDP, 2019), and they own only 15 % of the land (National Institute of Statistics, 2019), which leaves women in a vulnerable state of dependency for land. Only 15.1 % of adult women complete secondary education compared to 28.1 % of men (UNDP, 2019), leaving them less likely to be socially and financially independent. Cambodian women are less active in the labor market than men (UNDP, 2019). A potential to improve gender equality has been noted by the National Institute of Statistics (2018) in light of social, economic, and demographic changes and is reflected in their statement: *"Educational opportunities have increased greatly as well as employment opportunities for women"* (National Institute of Statistics, 2018, p. 8).

In terms of ethnicity, Cambodia is comparatively homogenous. The Cambodia Socio-Economic Survey of 2017 estimated 97 % of Cambodians to be ethnic Khmer, 2 % to be Cham, and 1% to be small minority groups including hilltribes, Chinese, and others (National Institute of Statistics, 2018).

1.1.2 Agriculture and Land Rights

The main area of agricultural production in Cambodia is the Tonle Sap zone in central Cambodia, having the largest share of agricultural land and income, followed by the Plain zone (National Institute of Statistics, 2018). In general, Cambodian agriculture is undergoing a process of crop diversification (Ofori et al., 2019). The area for paddy rice cultivation, which is the main staple crop, *"declined from 86 % of total cultivated area in 2002 to 74 % in 2011"* (World Bank, 2015, p. 132).

Farmers increased their non-rice crop cultivation as these crops are higher in value. This was supported by a government program of $20 million U.S. dollars which encouraged local vegetable production and discouraged vegetable imports from neighboring countries (Ofori et al., 2019). The most frequently cultivated fruit-bearing vegetables are cucumber, chilies, and eggplant, constituting about 14,000 hectares of planted lands. About 6,000 hectares are dedicated to leafy vegetables such as lettuce and cabbage.

During Cambodia's Khmer Rouge regime from 1975–79, private land property was abolished and the subsequent government under Vietnamese influence (1979–1992) did not favor private land ownership either. The consequences for land registry and land tenure are still felt today in the form of persistent legal uncertainties.

Social Land Concessions

The Cambodian government adopted an interim land policy through which it grants social land concessions to poor or vulnerable individuals and groups under certain criteria (See Annex 2: Social Land Concessions). An SLC is a legal mechanism to permit the transfer of state private land[2] to private individuals or groups for a social purpose (Royal Government of Cambodia, Sub-Decree 19, 2004). The distributed land originates from three sources: economic land concessions (ELCs), illegally obtained land, or degraded forest. The land must be conflict-free and vacant to be considered as an SLC. The conditions to obtain a land title for this allocated land are bound to certain criteria including the continuous cultivation of the land for at least five years.

In light of landless Cambodians' challenges, high poverty rates, and constraints on land reallocation including land grabbing related to *Economic Land Concessions (ELCs)*, the Cambodian government issued a sub-decree on SLCs in 2003 (Hennecke et al., 2018) (see textbox on SLCs). But the SLCs created new challenges. Early lessons show that one of the biggest constraints to the successful distribution, maintenance, and use of SLCs was the condition of the land upon reception; much of it was degraded forest and unsuitable for agricultural use. As a result, many households have not moved onto the land allocated to them as, without savings, they do not have the means to survive until their first yields. Instead, they continue their waged labor, leaving no time to work on the land allocated to them (Hennecke et al., 2018). Another threat for the land recipients is the legal requirement to

[2] "*State private land is all property that belongs to the state but does not have a public interest value. It is defined as land that is neither state public land nor legally privately or collectively owned or possessed under the Land Law of 2001.Any land that is not private land or does not have a public interest is de facto state private land.*" (https://opendevelopmentcambodia.net/topics/state-private-land/)

cultivate the SLC for at least five years before they receive the land title (Feldt, 2016). Further, the recipients' livelihoods and food security remains precarious as they have limited access to sustainable social and economic services, like schooling, childcare, employment, and banking; furthermore, conflicts over the allocated land often lead to obstruction of successful allocation (Neef et al., 2013).

To improve the allocation of land titles and to create a basic infrastructure in SLC villages, the Cambodian government launched the Land Allocation for Social and Economic Development Project (LASED) with financial support from the World Bank (Hennecke et al., 2018). From 2008 to 2015, the GIZ provided technical support directly within LASED. After 2015, GIZ shifted its strategy toward a bridge program improving livelihoods and providing support and infrastructure more directly to the land recipients. This bridge program is still being implemented via the ILF projects.

1.1.3 Agricultural Cooperatives in the ILF Project Context

The Land Rights Program had been supported by the GIZ in the preceding 17 years with several projects, all aiming to secure legal access to land and land tenure for formerly landless and land-poor households (Müller, 2013). The ILF program was launched by GIZ in 2014 as a result of the Land Rights Program of the Cambodian Ministry of Land Management, Urban Planning and Construction (MLMUPC). Under the ILF I and II, the GIZ supports about 7,000 land-recipient households in five provinces in central and eastern Cambodia.

The ILF program was established to help SLC recipients increase their household food security by providing a broader range of agricultural products and new, sustainable production techniques. The main targets of the ILF projects are to

1) improve food security,
2) develop a basis for long-term agricultural production, and
3) stimulate local development through new partnerships between local authorities and stakeholders in civil society and the private sector.

The activities to achieve these targets include stimulation of cultivation on the SLC plots and stimulation of market access for cash crops such as cassava, cashew, peanuts, and sesame. The projects also promote the establishment of home gardens to provide households with diversified and healthy nutrition.

The ILF I project targeted 3,148 land recipient households in Kratie, Tboung Khmum, and Kampong Thom and came to an end in September 2020. The GIZ is continuing its efforts in the ILF II project until at least June 2021, supporting about

3,800 households in Kratie, Kampong Speu, and Kampong Chhnang. A follow-up phase is envisaged. The ILF program is financially supported by the German Federal Ministry for Economic Cooperation and Development (BMZ; GIZ, 2015, 2019).

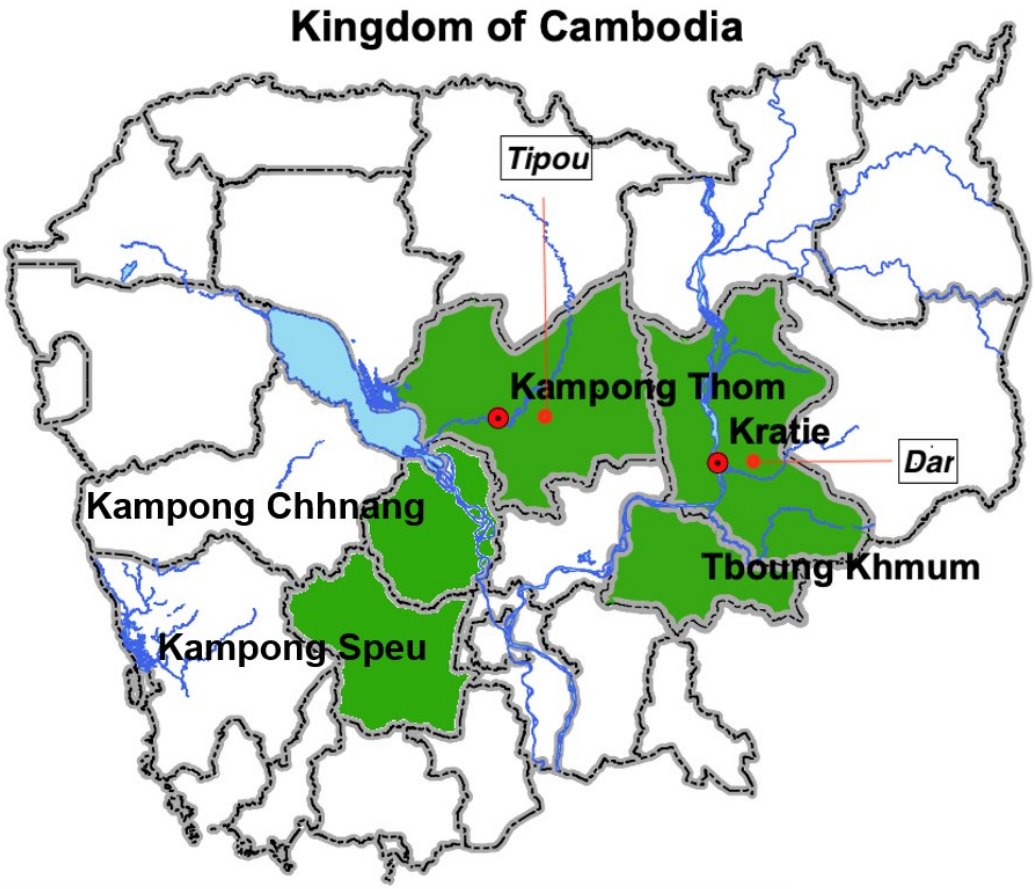

Figure 1: ILF Project Target Provinces and Location of ACs

Notes: Target provinces of ILF I and II, provincial capitals and AC's villages.

Source: SLE, 2020, adapted from GIZ

In this study, we focused on two agricultural cooperatives (ACs) supported by the ILF: the Aukorkei Agricultural Cooperative (AAC) in the commune of Dar, Kratie province and the Sen Akphiwat Samaki Agricultural Cooperative (SASAC) in the commune of Tipou, Kampong Thom province.

In the initial stages of the ILF, the GIZ provided training to SLC recipients on soil preparation and cultivation techniques to enable them to successfully cultivate their plots. In the first six months after these trainings, GIZ established Food Security Groups (FSGs) that installed rice banks (KII, Günter Wessel). As part of the ILF I, three to five tons of rice were delivered to the target communities as an initial

stock for the rice banks. The rice was stored and managed by the FSGs' elected leaders, who kept records of the amounts of rice going in and out. In situations of food shortages, vulnerable families could buy rice from the rice bank at below the current market price (in cash or on credit) and replenish stocks when prices levels stabilized. These rice banks were one of the first services offered by the ACs.

The FSGs developed savings groups from which participating households could borrow money and repay it later. Interest groups for agricultural activities including vegetable, fruit, cashew, cassava, chicken, duck, and fish farming were formed and representatives and spokespersons for each group were elected, some of whom were later elected as community representatives. Gradually, the savings and interest groups developed into more formal and institutionalized entities and were formally recognized as ACs.

Both the AAC in Kratie and the SASAC in Kampong Thom were registered by the Cambodian Ministry of Agriculture, Forestry and Fisheries (MAFF) in June 2018 (Certificate of Registration of Agricultural Cooperative of Aukorkei Agricultural Cooperative, 2018; Certificate of Registration of Agricultural Cooperative of Sen Akphiwat Samaki Agricultural Cooperative, 2018).

In March 2020, the AAC had 80 registered members and the SASAC had 94 (GIZ internal document, 2020). To become a member of either AC, applicants purchase shares of amounts ranging from 2,000 riel ($0.50 U.S. dollars) to 10,000 riel ($2.50 U.S. dollars; KII Sok, GIZ). Members receive a dividend from the cooperative at the end of the year for these shares. Both ACs have a Board of Directors (BoD) and a supervisory committee, in which the number of members has not changed since the registry in 2018 (KIIs DAFF representatives). In addition, both ACs have assigned the following key positions to members (GIZ internal document, 2020):

- AC Leader
- Deputy Leader
- Cashier
- Treasurer
- Chief Auditor
- Deputy Auditor

The service portfolio of both ACs is diversified, ranging from agricultural and business capacity trainings for agricultural equipment rental services to the provision of inputs and loans.

The ACs hold contract farming agreements with several Cambodian enterprises for cassava, cashew, mung bean, and sesame. Contract farming is an agreement between farmers and contractors for the production and supply of agricultural products (Cai et al., 2008). In exchange for the delivery of agricultural produce at an agreed quantity and quality at a specified price, the contracting company may

provide the farmers with credit, seeds, fertilizers, pesticides, and extension services upfront, all of which may be charged against the final purchase price (Sari, 2011; Thorng & Chao, 2016). In addition, contract farming may provide smallholders access to international markets which they would not be able to reach otherwise. However, contract farming arrangements are not always beneficial to farmers and incur risks for individual smallholders. The most common issues described in literature are the unequal distribution of bargaining power between farmers and contracting firms and the potential for reduced profit margins (Sari, 2011). These risks can be counterbalanced if individual smallholders organize themselves in a cooperative. ACs can act as powerful intermediaries in negotiating and bargaining with contracting companies on behalf of farmers as a collective force (Sari, 2011).

1.2 Hypothesis, Study Objectives, and Research Questions

Hypothesis

Based on literature analysis (Chapter 1.1; Chapter 2), we hypothesized that successful business operations, a high degree of social inclusiveness within ACs, and the use and dissemination of local agricultural knowledge contribute to ACs' autonomous and sustainable functioning. In turn, these performing ACs have the potential to improve livelihoods and increase the food security of their members' households (Figure 2).

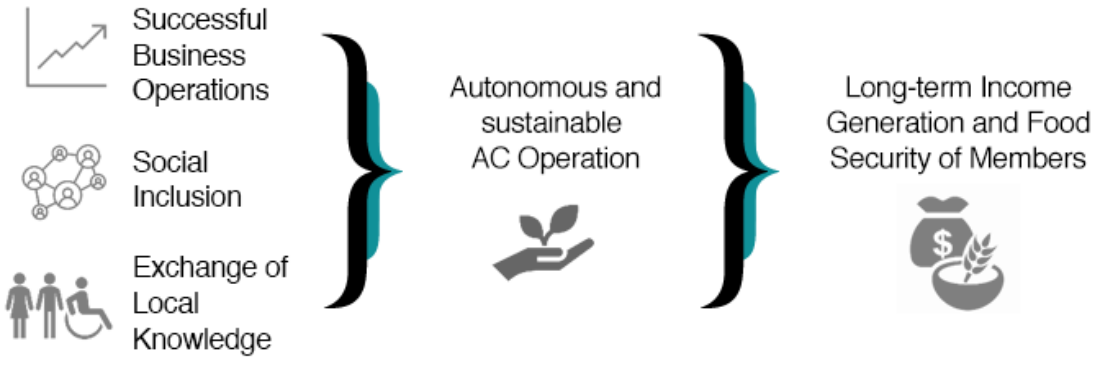

Figure 2: Hypothesis: Elements for Autonomous and Sustainable ACs

Study objectives

To evaluate the effects of both ACs on livelihoods and food security, we concentrated on three related fields:

- assessing the contributions of the AAC and the SASAC to the livelihoods and food security of their members' households,
- identifying issues pertaining to members social inclusion and participation in both ACs,
- assessing the use and exchange of local knowledge in ILF target communities.

Outcomes

To achieve these objectives, our study design was built around one primary and two secondary outcomes:

- Outcome 1: The users (GIZ, MAFF, MLMUPC) implement the study's recommendations to maximize the benefits of the ACs in ILF target communities and ensure their autonomous operation in the long term.
- Outcome 2: The user (GIZ) implements recommendations to strengthen social inclusion in both ACs (participation of members and mitigation of institutional barriers).
- Outcome 3: The user (GIZ) implements recommendations to support and promote the distribution of local agricultural knowledge.

From each outcome, several outputs were derived. To reach the first outcome,

- the impact of the ACs on smallholders' food security and livelihoods is determined (Output 1.1) and
- the factors contributing to the autonomous operation of both ACs after completion of the ILF projects are identified (Output 1.2).

To contribute to the second outcome,

- persons and groups which are excluded from the ACs as well as internal barriers that make their inclusion difficult are identified (Output 2.1) and
- appropriate measures to strengthen social inclusion in ACs are identified (Output 2.2).

To contribute to the third outcome,

- a concept to identify and exchange local agricultural knowledge in the ILF target communities is developed (Output 3.1).

Research Questions

From these outcomes and outputs, the following guiding research questions (RQs) have been derived:

- RQ 1.1: To what extent do both ACs contribute to improving land recipients' livelihoods and food security in the target communities?
- RQ 1.2: What organizational structure can be recommended to the ACs to allow them to better contribute to the ILF project objectives?
- RQ 1.3: What is the potential for both ACs to run autonomously in the long term?
- RQ 2.1: How must the ACs be structured to promote social inclusion?
- RQ 2.3: How does this affect the degree of participation of formerly landless and land-poor smallholder farmers?
- RQ 3.1: How do the target groups share their local agricultural knowledge (e.g., about local resources, food systems, and land use)?
- RQ 3.2: Which measures can help capture local knowledge and make it available to the target groups?

2 Conceptual Framework

2.1 Agricultural Cooperatives

An agricultural cooperative (AC) is defined by the International Co-operative Alliance (ICA) as *"an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise"* (ICA, n.d., p. 1). Collective action is the ACs' core resource. The idea is that smallholders can collectively mobilize capacities and resources necessary for development and in turn *"cooperate out of poverty"* (Develtere et al., 2008). ACs enable individuals to collectively achieve goals that they may not be able to achieve by themselves. For instance, ACs can help smallholders optimize production and minimize transaction costs by shortening the supply chain, facilitating market access, and providing information, technology, credit, and other goods and services (FAO, 2010). ACs may also empower their members economically and socially by involving them in decision-making processes or strengthen their livelihoods by enabling them to become more resilient to economic and environmental shocks (World Bank, 2010). Furthermore, ACs can increase their members' bargaining power by channeling collective action, therewith strengthening their economic and political position.

ACs contribute to agricultural income generation worldwide. For instance, in Brazil, ACs were responsible for 37 % of agricultural GDP and 5 % of overall GDP in 2009; in Mauritius, cooperatives account for more than 60 % of national production in the food crop sector; in Kenya, the agricultural savings and credit cooperative sector has assets worth 31 % of gross national savings (IFAD, 2011). A scoping review of the effects of ACs by Bizikova et al. (2020) showed that 57 % of the 239 reviewed studies in India and Africa reported positive impacts on farmer income and around 20 % of the studies reported positive impacts on crop yield and production quality. Furthermore, multiple studies conducted in Asia and Africa have shown that ACs' economic impacts have led to positive effects on their members' food security and livelihoods (e.g., Ortmann & King, 2010; Theng et al., 2014; Wanyama, 2014; World Bank, 2010).

However, the results of these studies have also been subject to criticism. For example, increasing food prices may boost agricultural growth and farmers income, yet also cause an increase in the cost of living for the poor (World Bank, 2010). The actual effect that ACs have on regional development and poverty reduction is, therefore, not always straightforward (Bijman et al., 2016).

ACs may also serve the interests of the wider community. They can be drivers for the inclusion of the poor and, generally, seek to not discriminate against features of heterogeneity such as income, religion, gender, or other markers of socio-cultural differentiation (ICA, n.d.).

In the following table, ACs' principles and values are presented as formulated by the ICA:

Table 1: Cooperative Principles and Values

Cooperative Principles	Cooperative Values
voluntary and open membership democratic member control members' economic participation autonomy and independence education, training, and information cooperation among cooperatives concern for community	self-help self-responsibility democracy equality equity solidarity

Source: Adapted from ICA, n.d.

Despite these values and objectives for equality and equity, ACs have been found to benefit mainly middle-class farmers. This process is known as the *"middle-class effect"* (Shiferaw et al., 2011, p. 9). Bizikova et al.'s 2020 scoping study showed that poor farmers require additional support to improve their situations before they are able to benefit from cooperative membership.

Agricultural Cooperatives in Cambodia

For historic reasons, there has been widespread mistrust of public collective organizations in Cambodia, primarily due to the different systems of government-driven collectivization initiated between 1975 and 1992. However, in 2001, Cambodia legally recognized privately organized ACs by issuing the Royal Decree on Agricultural Cooperatives (Royal Government of Cambodia, Decree NS/RKT/0701/234, 2001). Over the previous decade, formal collective action was virtually non-existent in Cambodia (Ovesen et al., 1996).

The first ACs that were established after 2001 primarily facilitated credit and loans, stimulated markets and supply of inputs, and provided agricultural technical support (Chanrith, 2008). At least 850 ACs have been established in rural Cambodia with the support of nongovernmental organizations (NGOs) and development agencies as well as local authorities and public sector organizations (Cambodian Ministry of Agriculture, Forestry and Fisheries, 2019). ACs are increasingly recognized as a means to tackle challenges related to the development of the Cambodian agricultural sector and contribute to regional development (e.g. ASEAN, 2016; Kindness & Gordon, 2002).

A 2010 World Bank study shows that the main reasons cited by Cambodian smallholder farmers to join an AC were 1) to borrow money at lower interest rates (rates of 2–3 % per month) and with flexible repayment schedules and 2) to receive technical assistance, training, and inputs from development agencies (World Bank, 2010).

Two studies that evaluated the effects of ACs in Svay Rieng province, Cambodia, show that AC members have better access to the local vegetable market (Phon, 2016) and that member households have higher incomes than non-members (Chen et al., 2018). However, these studies do not account for possible selection bias in their estimates. Ofori et al. (2019) assessed the effects of AC membership in Battambang and Siem Reap provinces, Cambodia, based on propensity score matching (PSM). The results indicated that membership in ACs had no effect on agricultural income; however, the results suggest that AC membership positively affects access to technology, credit services, and information. This improved access to goods and services was also noted by Chen et al. (2018). Furthermore, Ofori et al. (2019) found that horticulture, as a component of an agricultural diversification strategy, can support farm income. The results of these studies suggest that many of the benefits of cooperative membership stem from the ACs' provision of services and might, therefore, not necessarily produce higher incomes.

According to a study by the World Bank (2010), many Cambodian ACs suffer from a lack of institutional capacity and lending capital, compromising their commercial viability. Furthermore, their goals often closely resemble the objectives of the development agencies assisting their operations. Hence, when the support agency decides to withdraw support, the AC may not be able to sustain its operations (World Bank, 2010).

2.2 Sustainable Livelihood Framework

A livelihood is understood as a means of making a living. It encompasses people's capabilities, assets, income, and activities which are required to secure the necessities of life (IFRC, 2019).

> *"A livelihood is sustainable when it enables people to cope with and recover from shocks and stresses (such as natural disasters and economic or social upheavals) and enhances their well-being and that of future generations without undermining the natural environment or resource base"* (Chambers & Conway, 1992, p. 10).

The Sustainable Livelihoods Framework (SLF) established by the Department for International Development (DfID; fig. 3) is an operational concept used to plan development initiatives and to assess their contributions to livelihood sustainability.

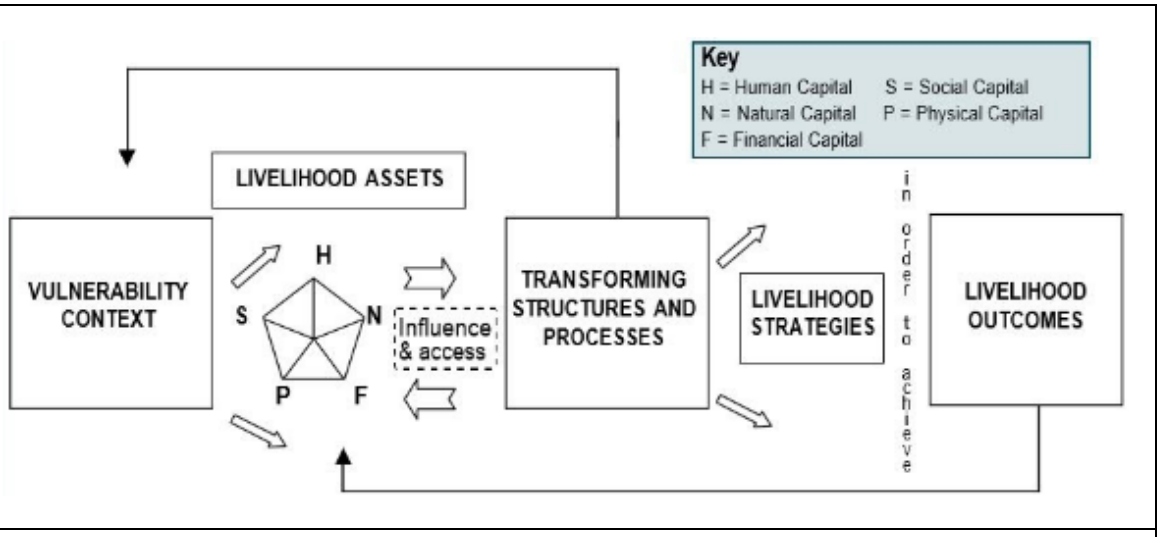

Figure 3: The Sustainable Livelihoods Framework

Source: DfID, 1999

The concept emphasizes the manifold interactions which may affect people's lives (DfID, 1999) and introduces various sub-categories of assets to differentiate the rather broad concept of livelihoods:

- Human assets, e.g., skills, knowledge, ability to work, and health
- Natural assets, e.g., access to land, forests, water, and clean air

- Financial assets, e.g., savings, credit, and other sources of investible resources, including migrants' remittances
- Physical assets, e.g., infrastructure such as roads, buildings, water supplies, equipment, and transport
- Social assets, e.g., friends, family, social organizations, and other people who can offer support

The SLF stimulates holistic thinking: What factors might make the poor vulnerable, which assets and resources help them to thrive and survive, which policies and institutions impact their livelihoods, and what type of outcomes do the poor themselves aspire to? The framework needs to be adapted to both local circumstances and local priorities (DfID, 1999). The SLF offers a way to look beyond food security and get a broader picture of target groups' livelihoods.

ACs offer a variety of services to their members related to the various asset categories mentioned above, e.g., resources, information, communication, input, credit, access to markets, technologies, and trainings (Wanyama, 2014). These services may contribute to food availability and improve nutrition by diversifying the households' food supply. They also promote employment by creating marketing opportunities for both members and non-members. According to the FAO (2010), ACs also contribute to business models that are resilient to economic and environmental shocks.

2.3 Food Security and Nutrition

During the World Food Summit of 1996, the participants agreed on the following multidimensional definition of food security: *"Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."* (FAO, 2006, p. 1). This standard definition comprises four dimensions:

- food availability: the availability of food both in quantities and qualities
- food access: individuals' ability to access adequate resources
- utilization: utilization of an adequate diet, clean water, sanitation, and health care to guarantee nutritional well being
- stability: the guarantee of access to food at all times

The Household Dietary Diversity Score (HDDS) and the Food Insecurity Experience Scale (FIES) can capture these four dimensions and are briefly described in the following.

Household dietary diversity score (HDDS)

The HDDS counts the number of food groups that a household has consumed over the preceding 24 hours. We added some groups to the HDDS standard list to better reflect Cambodian dietary habits (see chapter 3.2.1, Statistical Analysis). The HDDS is meant to reflect, in a snapshot, a household's economic ability to access a variety of foods. Studies have shown that an increase in dietary diversity is associated with socio-economic status and household food security (FAO, 2011).

Food Insecurity Experience Scale (FIES)

To measure food security at the household level, we used the FIES index and integrated the standard questions in the household survey (HSS). The FIES was developed by the FAO and relies on direct "yes" or "no" responses to eight brief questions about access to adequate food (Cafiero et al., 2018). Each FIES question refers to a different experience and is associated with a different level of severity of food insecurity: mild, moderate, and severe. People experiencing moderate levels of food insecurity will typically eat low-quality diets and might have been forced, at times during the year, to reduce the quantity of food they would normally eat, while those experiencing severe levels would have gone entire days without eating due to lack of food.

2.4 Social Inclusion

In development discourses, ACs are often heralded as particularly inclusive and participatory business models, supporting marginalized and otherwise disadvantaged farmers. According to its cooperative principles, the ICA states that cooperatives are *"open to all persons able to use their services and willing to accept the responsibilities of membership, without gender, social, racial, political or religious discrimination"* (ICA, n.d.).

But what does social inclusion mean and why does it matter for the independence and sustainability of AC activities? The United Nations define social inclusion as *"the process of improving the terms of participation in society, particularly for people who are disadvantaged, through enhancing opportunities, access to resources, voice and respect for rights"* (UN, 2016). It is a context-specific and multidimensional concept that is sensitive to time, place, and identities (Tas, 2015).

The meaning of social inclusion is perhaps best captured by referring to its opposite: social exclusion. Labonté et al. (2011) define social exclusion as "*processes by which people (individuals, groups) are prevented from participating in social and economic activities to the fullest extent they desire"* (p. 4). Based on their analysis of indicators of social exclusion and inclusion, we adopted and modified the following four dimensions of social exclusion for our study context:

- disengagement (e.g., lack of participation, lack of opportunities to give voice to the policy choices of a cooperative, lack of sense of belonging)
- discrimination (e.g., gender, ethnicity, age, education, disability)
- exclusion from services (e.g., extension trainings, health care)
- economic exclusion (e.g., lack of access to cooperative membership, inadequate access to credit).

The role of participation is a corner stone in the above-mentioned definition of the United Nations. The facilitation of farmers' participation in ACs' decision-making processes enables farmers to voice their concerns and enhances the congruence of AC policies and member demands. Considering the Participation Pyramid of Straßburger and Rieger (2014), "*participation means being involved in decisions and thus being able to influence the outcome. It is based on clear agreements that regulate how a decision is made and how far the right to co-determination extends"* (p. 230).

The rationale for participation in ACs is both normative and operational. Drèze and Sen (2002) argue that "*the process of public discussion and participatory interaction can make citizens take an interest in the lives of each other"*. They criticize approaches that treat participation as a means only and rather stress its intrinsic importance. Participation can strengthen democratic values because it contributes to a more inclusive and deliberative form of decision-making (Baker & Chapin, 2018). After all, participation is one of the guiding principles of the Universal Declaration of Human Rights.

Besides these normative aspects, numerous studies have shown that promoting participation and ownership produces tangible outcomes (e.g. Baker & Chapin, 2018; Norad, 2013; Wright, 2003). Fung and Wright (2003) argue by means of their model of empowered participatory governance that ordinary people often "*possess intimate knowledge about relevant situations"* (p. 25) and may also know best how to improve these situations. More voices are heard and, as a result, people share more information and offer alternative solutions. Participation may also strengthen one's commitment to implement decisions because it creates ownership.

Participation can also be more efficient: considering a diversity of opinions from an early stage on can shorten feedback loops and shorten bureaucratic procedures.

In the context of the target ACs, we used the Framework for Analyzing Participation in Development created by the Norwegian Agency for Development Cooperation (Norad) to analyze participation levels. This theory-neutral framework provides a checklist for capturing a wide range of forms of participation by asking who participates, in what way, and for what reason. It also helps to provide information about the community's satisfaction with services, power relations, social connectedness, and access to the ACs (Norad, 2013). We used this framework to better capture the different forms of participation, which we found in the ACs.

2.5 Local Knowledge

The concept of local knowledge promotes ownership in sustainable development strategies. According to the FAO, it refers to *"knowledge that people in a given community have developed over time and continue to develop. It is:*

→ *based on experience,*
→ *often tested over centuries of use,*
→ *adapted to the local culture and environment,*
→ *embedded in community practices, institutions, relationships, and rituals,*
→ *held by individuals or communities, and*
→ *dynamic and changing."* (FAO, 2004, p. 7).

In contrast to the concepts of traditional and indigenous knowledge, local knowledge refers to larger knowledge systems that include both traditional and modern knowledge (Warburton & Martin, 1999). It comprises the knowledge of all people inhabiting a specific territory, whether these communities are rural, urban, settled, nomadic, original inhabitants, or migrants. The spread of local knowledge for the process of developing sustainable development strategies is important because the farmers have unique and detailed knowledge of their local environment. Including the concept of local knowledge exchange in development strategies fosters values of self-help and self-responsibility. At the same time, ACs hold the potential to increase and support the exchange and disseminate local knowledge throughout their community.

3 Methodology

We devised a mixed-methods approach which rests on three interdependent pillars: 1) a quantitative HSS among beneficiary households and a control group, 2) qualitative village workshops based on the toolbox for participatory rural appraisal (PRA) and 3) key informant interviews (KIIs) with local and national stakeholders of the project and business partners. The COVID-19 pandemic and the related travel restrictions forced us to steer the research process remotely from Berlin.

The primary research units were the AAC (Commune of Dar, Kratie province, 80 members) and the SASAC (Commune of Tipou, Kampong Thom province, 94 members). This includes their heads and member households who are often land recipients targeted by ILF projects and located in the catchment area of both ACs. The study investigates developments occurring after 2010, when the first SLC plots were allocated to landless and land-poor people in the research area. The study team collected data in September and October 2020 mainly in the communes of Dar (Kratie) and Tipou (Kampong Thom). Two villages in the neighboring provinces of Kampong Speu and Kampong Chhnang were also included for PRA village workshops because their organic agricultural production is also certified via these ACs.

3.1 Special Considerations in Remote Research

Normally, SLE students put their newly acquired skills and knowledge into practice in a six-month empirical study that includes three months of field work in a foreign country; however, the COVID-19 pandemic posed completely new challenges for field research and data collection.

The first Cambodian COVID-19 case was detected on 27 January 2020 and the government reacted swiftly with a strict containment policy. Measurements included strict medical control of all incoming travelers and contact tracing of infected people. Until late November 2020, 323 COVID-19 infections and no deaths were recorded. For much of 2020, the measures resulted in Cambodia being free of COVID-19 apart from a few cases directly detected upon immigration.[3] Nevertheless, in agreement with the Humboldt University and the GIZ, it was decided that the research team should avoid traveling to Cambodia.

[3] After our study period and from February 2021 onward, COVID-19 spread across Cambodia.

Since global travel restrictions prevented in-person collaboration, re-envisioning project management and administration became an immediate priority. Local research teams were established to facilitate the research and build a comprehensive database. In this section, we will discuss the special arrangements made to allow this innovative, collaborative research project to move forward while team members were separated by oceans by COVID-19 transmission prevention restrictions. First, we will discuss the recruitment of research teams in Cambodia, then discuss adaptations to the main study components (HSS, PRA, and KII) to allow for remote and digital collaboration. As this approach was novel, we provide a SWOT analysis of the special arrangements outlined here in section 5.6.2.

The decision to work remotely from Berlin needed to go along with a reshuffling of budget lines. Travel expenses had to be reallocated to local salaries. Eventually, the remote research resulted in a more intense use of local expertise and higher levels of responsibility on side of our research partners. Interestingly, the reallocation of the budget also led to significant savings in the double-digit percentage range.

Even though the authors still regret a lack of context knowledge it can be concluded that remote research has proven to be feasible, to foster in-country expertise and to economize budgets. A hybrid model would be desirable that combines the advantages of both approaches, remote work and field work.

3.1.1 Recruitment of Local Research Teams

An important first step was the recruitment of a local coordinator to facilitate the recruitment of local field staff, oversee contract negotiation for local staff with GIZ Cambodia, and act as an intermediary between GIZ Cambodia and the on-site research teams. While the national coordinator took over local administration, all content-related study issues were handled by the team in Berlin. The national coordinator also attended and documented some of the participatory workshops. Her expertise and work experience helped the Berlin-based researchers to better understand the local context. She was indispensable.

For the recruitment of enumerators, workshop facilitators, and a translator, job descriptions were circulated via popular job portals in Cambodia. Based on our criteria, the national coordinator conducted pre-selection of the applications. Candidates were interviewed remotely via video-call interviews with the Berlin-based team leader and two team members as well as the national coordinator. All interviews were evaluated using a pre-established evaluation and ranking scheme.

It later became clear that several professional private research companies operate in Cambodia and a decision was made to entrust HSS data collection to one of these research institutes. Three offers were obtained and the most suitable was chosen: The Nuppun Institute for Economic Research.

3.1.2 Household Survey

The HSS questionnaire was devised by our Berlin team, translated by Nuppun, discussed and adapted with the Berlin team following two-day field testing, and efficiently implemented by Nuppun. The adjusted data records were fed back to the Berlin team which further processed, analyzed, and prepared the data for triangulation.

3.1.3 Participatory Rural Appraisal

The remote implementation of the participatory village workshops proved to be particularly challenging. The Berlin-based team devised a detailed manual for planning and implementing the workshops, requiring solid preparation, frequent communication with the implementing team in Cambodia, and flexibility in the methods to allow for adaptation to the local context. The manual was continuously adapted to local conditions and needs as research progressed.

An experienced and skilled interdisciplinary team was carefully chosen to facilitate the workshops, and particular importance was given to digital literacy to assure good communication and documentation. This PRA team consisted of a lead facilitator with field experience in participatory methods and four assistant facilitators, with a clear division of tasks and responsibilities. In addition, a freelance PRA trainer was contracted to train the team in PRA and to participate in the field testing as an observer.

Village workshops were organized by the PRA team in close cooperation with GIZ field officers and local authorities and debriefings were conducted remotely between the Berlin and Cambodia teams for quality assurance and exchange of information on workflow, challenges, and context.

3.1.4 Key Informant Interviews

Some key informant interviews were conducted digitally by our team in Berlin. In remote settings without suitable internet connection, a translator conducted interviews with local and provincial authorities, AC representatives, and land recipients as per pre-established interview guidelines. As proposed by Temple and Young (2004), the translator was introduced to the research topic and treated as a

member of the research team. The translator made all efforts to translate the words with respect to the original tone and intention, but still the resulting transcripts are not literal quotes but transliterations with a certain space of interpretation.

Toward the end of the research phase, the translator independently conducted additional interviews on EcoSan toilets requiring another two days traveling in the countryside.

3.2 Mixed-Methods Approach

The study used a mixed-methods approach for data collection which simultaneously allowed for an explorative and in-depth investigation of the research questions. Quantitative and qualitative research instruments were combined to reduce the risk of systematic errors and to lend more validity to the data (Flick, 2008; Hussy et al., 2013). In brief, we conducted a quantitative HSS and analyzed the data according to Propensity Score Matching (PSM), descriptive statistics, and linear regression. Qualitative data were gathered via KIIs, in-depth interviews, and selected PRA tools, including an adapted version of the participatory Method for Impact Assessment of Programs and Projects (MAPP), Venn diagram, and SWOT analysis. Empirical data collection was conducted strictly in line with local COVID-19 guidelines and regulations to ensure the safety of the interviewees and study team. Results from all methods were merged and triangulated to capture the complexity of the context from different perspectives and to increase validity, reliability, and inter-subjective traceability.

3.2.1 Household Survey

Questionnaire

A standardized questionnaire was devised by the Berlin team based on literature and complemented by expert information. It was translated to Khmer by Nuppun. Most of the questionnaire consisted of closed questions to allow for efficiency in the interview process, data aggregation, and statistical analysis. A limited number of open questions were added to capture viewpoints that would otherwise have been lost.

The questionnaire comprised twelve sections:

1. Housing and infrastructure: interviewers observed the quality of the housing and the infrastructure in the immediate vicinity of the household.

2. Demographics: socio-demographic data of the respondents (e.g., age, gender, literacy, highest educational level, etc.).
3. Health: information related to water borne diseases that could lead to a reduced nutrient usage of affected persons.
4. Physical assets: the distance of the household from the nearest road and its agricultural plot as well as the household ownership of physical assets as a proxy for the socio-economic status of the household.
5. Drinking water and sanitation: sources of drinking water in the rainy and dry seasons as well as household access to sanitary facilities.
6. Agriculture: access to land, land ownership, loss and acquisition of land, cultivation of land, farming experience, provision of and participation in agricultural trainings as well as information about:
    a. Crop production, income generation from crop production.
    b. Livestock husbandry, income generation from livestock husbandry.
    c. Home gardening, consumption of home garden produce, income generation from home gardens.
7. Other income sources: sources of household income and income generation from sources other than agriculture.
8. Finances: total annual income, credit/ loans, and levels of indebtedness.
9. Agricultural cooperatives: participation in ACs, interaction with ACs, perceived changes as a result of use of AC services, and reasons for non-participation in ACs by ILF beneficiaries.
10. Social inclusion in ACs: participation in decision-making processes and equity within the ACs.
11. Food Security: Two indices were used to measure nutrition diversity and food security:
    a. Household dietary diversity score (HDDS): An assessment of the food groups that household members had consumed over the preceding 24 hours.
    b. Food Insecurity Index Scale (FIES): a logical sequence of eight questions related to recently experienced (previous 12 months) food insecurity.
12. Local knowledge: sources of local agricultural knowledge and their importance.

Implementation

We applied a multi-stage sampling procedure, known as clustering, to select the samples. For quantitative research, we opted for a full census of AC members (i.e.,

our treatment group). For the non-members (i.e., our control group), we used a simple random sampling. Considering a recommended confidence level of 95 % and a margin of error of 5 %, we had to include a minimum of at least 226 households (104 in Kratie; 122 in Kampong Thom) in our survey (Hussy et al., 2013). To increase the representativeness of the sample and to facilitate data analysis using PSM, we increased the number of selected households to about 300 with 150 AC member households (66 in Kratie; 84 in Kampong Thom) and at least 150 non-member households (66 in Kratie; 84 in Kampong Thom) to form the treatment and the control group, respectively.

Since some AC members were not at home at the time of data collection, a total of 293 respondents (220 women and 73 men) took part in the survey representing households with a total of 1,417 members. Even though 71 % of the households (n=208) were male headed, the majority of respondents were women. In Kratie, 72 AC member households (90 % of all AC members) and 71 non-member households took part in the survey. In Kampong Thom, the number of participating AC member households was 65 (69 % of all AC members), while that of non-member households was at 85. Of the AC members that took part in the HSS, 91 % (n = 125) were members at large without formal positions in the AC. In addition, two AC leaders (both from the AAC), six deputy leaders (three each from AAC and SASAC), three AC treasurers (one from AAC and two from SASAC), and one AC secretary (from SASAC) were interviewed during the HSS.

Pilot Test

A pilot test was conducted by Nuppun prior to the survey by Nuppun. Four face-to-face interviews were carried out to provide information on the quality of the instrument and tease out necessary revisions. Further, ten respondents were interviewed over the phone to check for the comprehensibility and relevance of the questions, to identify difficulties encountered by the respondents in answering questions, and to test the clarity and theoretical validity of the questionnaire.

Data Collection

Data were collected between 5 and 11 October 2020 by Nuppun with two teams of two field supervisors and six to eight enumerators. As the number of AC members was limited, we tried to conduct a full census of AC members without pre-selection. Non-members were randomly selected from village registers. We always favored interviewing the household head, i.e., the person in the house who is usually responsible for making decisions and earning money. If this was not possible, their partners were interviewed. In the rare situation that both were

unavailable, the oldest adult present was approached. When there was no person in the household who met the above criteria, the another randomly chosen household was targeted. At the end of each day, Nuppun and the Berlin team checked the data together for completeness and quality.

The survey was digitalized using the KoBo Toolbox platform supporting the computer-assisted personal interviewing (CAPI; e.g., Nampa et al., 2020; Baur & Blasius, 2014). As the HSS was conducted remotely, we considered CAPI advantageous for several reasons. First, the entire filtering process is carried out automatically by the questionnaire programmed in the application. Secondly, the data input can be monitored in real time and certain input errors (i.e., values outside the valid range) are inadmissible. Thirdly, this technique allowed the Berlin team to monitor the quality of the enumerators' work remotely, for example by tracking the time required to fill the questionnaire.

Figure 4: Interview with a Land Recipient in Dar village, Kratie province

Source: Yi Chheng Eang, 2020

Data Pre-processing

The full database was extracted from KoBo Toolbox in XLS file format. Identifying inconsistencies or outliers was first based on logical thoughts such as the correlation between questions. For instance, presuming that the respondent is

literate, they would have attended school and would have done so for at least four years. Recorrecting values was done by Nuppun after clarifying with the responsible enumerators. Answers in Khmer language were translated into English.

Statistical Analysis

We calculated means and standard deviation of most of the parameters that describe any of the twelve topics with characteristics of the sample. Differences between these parameters for members and non-members were compared for both the total data set as well as for each province separately. To assess these differences, we first tested each parameter for normal distribution (Shapiro-Wilk's test) and homogeneity of variance (Levene's test) and applied a logarithmic or square root transformation when these assumptions were not met. Means were compared by use of either a paired or non-paired t-test (simple t-test). For income data, we chose to calculate medians rather than means to prevent results distortion resulting from extreme outliers. Correlations between variables were either assessed by regression models, Pearson's correlation tests, or Kendall rank correlation tests. All statistical analyses were conducted using either the open-source software R 3.5.2 (R Core Team, 2018), SPSS (IBM Corp, 2020), or Stata (StataCorp, 2019).

Correction for Potential Selection Bias using Propensity Score Matching

To assess the effect of cooperative membership on livelihood and food security, multiple studies have used PSM. PSM allows statistical comparison of AC members and non-members who are similar on relevant observable characteristics. Therefore, PSM offers a way to assess membership effects while accounting for the "middle-class effect". For instance, a PSM study on the effect of cooperative membership among banana farmers in Kenya showed that the AC contributed to higher sales prices for bananas and increased farmers' incomes (Fischer & Qaim, 2012). Another PSM study from Rwanda showed that cooperative membership increased income and that this effect was most pronounced for larger farms (those with more hectarage of farmland) and those in more remote areas (Verhofstadt & Maertens, 2015).

In our case, we used PSM because cooperative membership is unlikely to be randomly distributed within any given population, so there is potential for selection bias. That means that smallholders who chose to join a cooperative and those who did not may have done so as a result of certain preconditions. For instance, farmers with more land, higher education, or more farming experience may be more likely to join an AC in the first place. PSM corrects for this potential selection bias. To

apply the PSM method, specific information on relevant observable population characteristics needed to be part of the HSS; therefore, 16 items related to demographics, household structure, property, education, and skills were added to the questionnaire.

We assessed the impacts of cooperative membership on economic or monetary farm performance for smallholder farmers in several steps. First, we estimated regression models for both the total sample set as well as for each province separately. A flexible set of agricultural performance indicators was defined and the regression model was estimated separately for each indicator. The following three performance indicators were selected: 1) Agricultural income on the household level, 2) Total income on the household level, 3) Total debt on the household level. To reduce the possible impact of outliers, all performance indicators were checked for a better fit with a log-transformation.

We took two steps to correct for potential selection bias resulting from pre-existing conditions. First, we included in the regression model the 16 selected variables that showed the highest effect on heterogeneity between households with or without AC membership, which were: gender, marital status, number of household members, age of household head, years of education, ownership of motorbike or cattle, walking time from house to plot, and size of land cultivated in the previous 12 months. Then, based on these relevant observable characteristics, we calculated a propensity score for each respondent. This is a score between 0 and 1 which shows the probability of being a cooperative member. With these scores, cooperative members (i.e., the treatment group) that are similar in the observable characteristics to non-members (the control group) were matched. For matching, we used the nearest neighboring method with a distance of five respondents. This is common practice for cooperative membership calculations. Once a suitable match is found, the difference in farm performance outcomes between the member and non-member can be attributed to the treatment, which is cooperative membership. To further assess the robustness of the findings, we applied two alternative matching methods, known as radius and kernel matching. The treatment effects were evaluated by using the average treatment effect on the treated (ATT). The ATT describes the difference between expected outcomes with cooperative membership and without cooperative membership, restricting the comparison to only those smallholders participating in the cooperative. As only the selected variables were included in the matching, there would have been a risk that certain important variables were missed. We applied the Rosenbaum bounds approach to search for such possible missed variables (DiPrete & Gangl, 2014). These statistical analyses were conducted using Stata 15.0 (StataCorp, 2019).

Household Dietary Diversity Score (HDDS)

We used the HDDS method to evaluate the number of food groups consumed by ILF target households in the 24 hours before data collection. As per the FAO recommendation of adapting the HDDS food groups to local dietary habits, we added some groups (e.g., insects) and included 14 food groups in the questionnaire.

We first descriptively analyzed how many food groups the AC members and non-members consumed. In a second step, possible correlations between cooperative membership and nutritional diversity were determined using Pearson's correlation analysis tests. We compared our results with the GIZ 'Food and Nutrition Security Surveys' to contextualize the levels and changes in the food security of target communities' families.

Food Insecurity Experience Scale (FIES)

We used the Rasch model to analyze FIES data. This model provides a theoretical base and a collection of statistical tools to assess the suitability of a set of survey questions and to compare a scale's performance across populations and survey contexts (Cafiero et al., 2018). We calculated internationally comparable estimates of the prevalence of food insecurity by assigning respondents to the classes of food (in)security defined by standard thresholds. We then calculated the proportion of the population experiencing 1) moderate or severe food insecurity and 2) severe food insecurity. To compare FIES data with previous GIZ results, we also used the GIZ's internal method of analyzing FIES data: the eight questions were divided between three food insecurity categories (mild, moderate, severe). If the respondents answered all four questions positively, they were considered "food secure". Were questions 1-3 answered positively, we considered the respondents "mildly food insecure"; were questions 4-6 answered positively, we considered them "moderately food insecure"; were questions 7-8 answered positively, we considered them "severely food insecure". These statistical analyses were conducted using the open-source software R 3.5.2 (R Core Team, 2018).

3.2.2 Participatory Rural Appraisal (PRA)

The study team used various methods from the PRA toolbox including an adapted version of the participatory MAPP, Venn diagram, and SWOT analysis.

Overview of PRA Tools

The study team opted for an adapted version of the MAPP to assess the ACs' impacts on ILF project beneficiaries' livelihoods and food security. MAPP is a participatory research method developed by the German Development Institute to

systematically analyze impacts of programs and projects from the beneficiaries' perspectives (Neubert, 2004; Neubert & Müller, 2010). MAPP uses participatory tools in a logical sequence to assess development impacts, including unintended and/or negative effects. In 2005, an SLE study team adapted the MAPP methodology for livelihood analysis in rural Cambodia (Weingärtner et al., 2005). This locally adapted version later became known as Participatory Livelihood System Analysis (PaLSA) (Guenther & Fiebiger, 2010). We developed our own approach by merging aspects of MAPP and PaLSA for focus groups composed of both AC members and non-members. The open and participatory character of the approach allowed us to capture AC members' perspectives of the benefits they derive from their membership in an AC. Identified, unintended, or negative effects shed light on questions regarding participation within and access to both ACs, which is relevant for Outcome 2.

The Venn diagram was used as a complementary tool to identify local strategies for knowledge exchange and documentation and to derive recommendations for supporting and promoting the exchange and dissemination of local agricultural knowledge. The Venn diagram workshops focused on sources of agricultural knowledge, measured the importance of these sources, and sought to derive strategies for continued, structured knowledge sharing.

SWOT analyses were conducted with representatives from each of the two ACs to provide a brief and up-to-date self-assessment of the ACs' organizational and social structures. SWOT analysis seeks to identify organizations' internal strengths and weaknesses as well as external opportunities and threats. Recommendations and adaptation strategies for future activities can be derived from SWOT analyses.

PRA Activities

Firstly, preparatory tasks and sampling were carried out for the first pilot in Kampong Speu (Prey Thom village, Raksmey Samaki commune) to adjust the methodology to the local context and give the field team a training opportunity.

The workshops in Kampong Thom (Sen Aphivath 1 Village, Tipou Commune, Santuk District) and Kratie (Ou Koki Village, Dar commune, Chet Borey District) were conducted to obtain data regarding the potential of ACs.

The workshop in Kampong Chhnang (Soksen Chey Village, Peam Commune, Samakimeanchey district) served to obtain information regarding the potential for sharing local knowledge.

The workshops took place in local community halls or schools. The number of participants ranged from 27 to 32 per workshop with an intended equal

representation of AC members and non-members. Each group was representative of the village's gender and age spectrum. To increase participation, compensate for lost time, and promote agricultural knowledge, each participant received lunch and an illustrated Cambodian book on agricultural techniques.

Participatory assessment of the factors influencing livelihoods and food security in the village was conducted. In the first step, called *Timeline and Identification of Livelihood Factors*, participants discussed key events in the last ten years that influenced their livelihoods and quality of life and rated them from difficult to excellent.

Figure 5: PRA Workshop in Kampong Chhnang

Source: Yi Chheng Eang, 2020

In a second step, *Collection and Prioritization of Livelihood Factors*, participants checked completeness of the livelihood factors and identified the eight most important ones. The factors included human, natural, financial, physical, and social assets.

The third step, *Analysis of the Main Livelihood Factors*, was facilitated simultaneously in two equally sized sub-groups that were heterogenous in age, gender, and AC membership. The first group worked on a "trend analysis" to analyze how the eight livelihood factors changed and influenced their living conditions over time. The second group analyzed interrelations between livelihood factors and the strength of the relationship by conducting a "Livelihood Matrix Scoring". Finally, the two sub-groups joined to present and discuss their results.

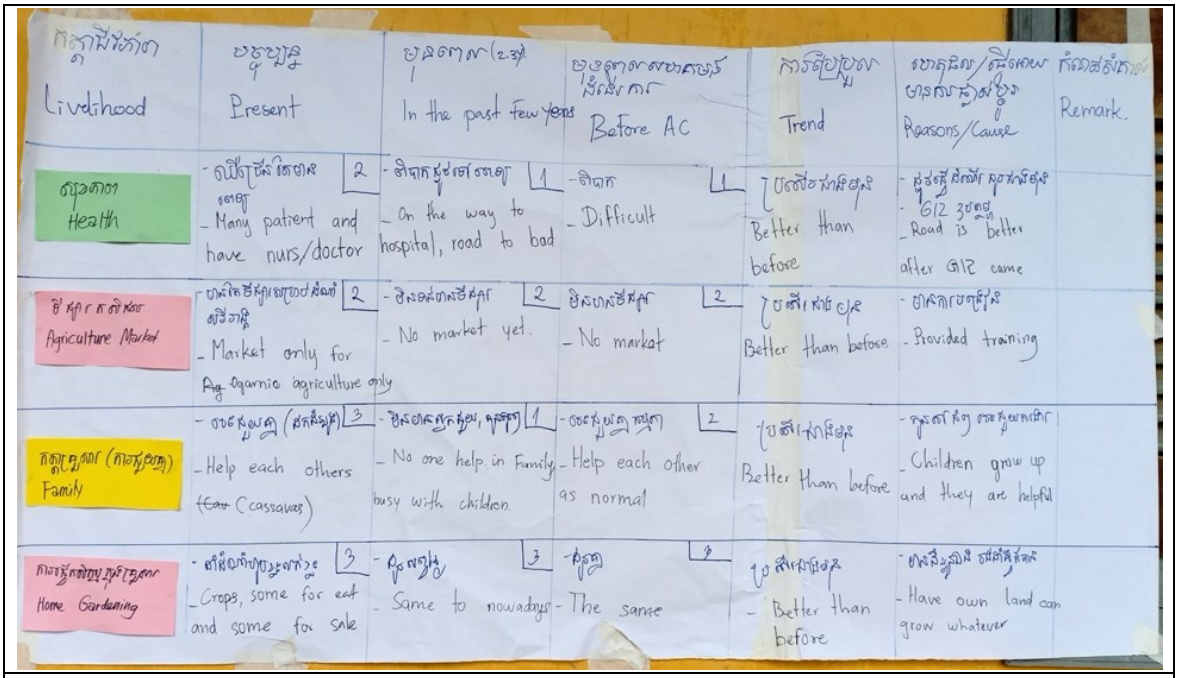

Figure 6: Third Step (A): Trend Analysis, MAPP Workshop in Kratie

Source: Yi Chheng Eang, 2020

In a fourth step, *Activity Introduction and Ranking,* the ACs' activities were listed, checked for completeness, described, and ranked according to their importance by the participants. A fifth step, *Activity Matrix Scoring*, was facilitated in two sub-groups and allowed for matrix analysis of each AC's activity's influence on selected livelihood factors. A sixth step, *Strengths and Weaknesses*, served to identify strengths and weaknesses of each individual AC activity.

The elaboration of a **Venn Diagram** is step seven. Participants brainstormed and discussed sources of (agricultural) knowledge then ranked them individually by their perceived importance. The sum of individual rankings indicates the perceived importance of each source and is visually illustrated by paper circles of different sizes, with larger circles indicating higher perceived importance.

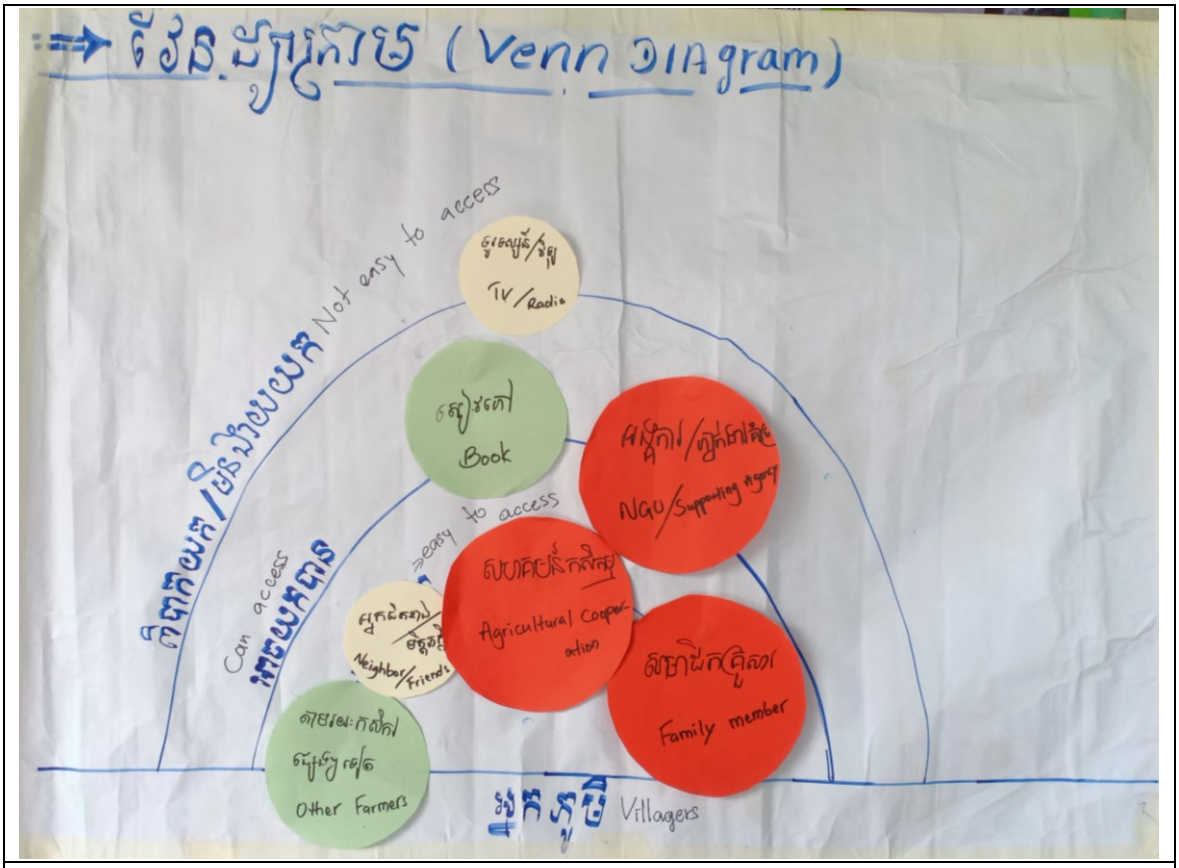

Figure 7: Sevens Step: Venn Diagram, Kampong Thom

Source: Yi Chheng Eang, 2020

In a second step, the accessibility of these knowledge sources was measured. The knowledge-source circles were placed on a rainbow chart, ranked from easily accessible (center) to difficult (periphery). Following discussion and reflection, the group proposed ideas on how to use these insights in their community for future knowledge exchange and devised an action plan.

Finally, the participants were asked about their visions and hopes for their villages' future development. The participants suggested and discussed improvements and how the ACs could contribute. A village walk served to cross-check the obtained data.

SWOT Analysis

A SWOT analysis collects and clusters strengths, weaknesses, opportunities, and threats in a given context. These workshops were held in separate settings and only with representatives from the two ACs. The participants discussed the results and proposed how strengths and opportunities can be maximized while

weaknesses and risks can be mitigated. Based on their analysis, participants developed recommendations for the future work of the AC.

Figure 8: SWOT Analysis with AC Representatives, Kampong Thom

Source: Yi Chheng Eang, 2020

Data Analysis

Finally, the collected data were aggregated and analyzed in the form of comprehensive village development profiles using pre-structured excel sheets which served as the primary tool for our analysis and included livelihood factor trends and the influence of AC activities on livelihood factors.

3.2.3 Key Informant Interviews

Qualitative interviews with key informants were crucial for the Berlin team to deepen their understanding of the study context, emerging themes and subjects and contextualize the findings of quantitative data sets.

The study team used purposive sampling to select research participants. The sample included individuals and groups (key informants) with in-depth knowledge of our research interests. In total, we interviewed 20 key informants: three from the ministries in charge of ACs, four from the GIZ, two commune chiefs, four land recipients, two representatives from NGOs, two AC representatives, one member of a farmers association, and two contract farming representatives. Details about interview partners and dates are found in Annex 3: List of Interviews.

The interviews were semi-structured around a guideline which allowed spontaneous changes depending on the interview dynamics. The interviews offered open questions covering subjects such as SLCs, history and development of ACs, relationship with the AC, participation, motivation, AC structure, AC objectives, AC actors and forms of cooperation, AC constraints and potentials, autonomous operation of ACs, certification, home gardens, indebtedness, change, innovation, local knowledge, digitalization, and COVID-19.

About half of the 20 interviews were conducted by the research team in Berlin via Skype or Zoom in English between 29 September to 12 October 2020; the other half were conducted by the translator during the field phase in Kampong Thom and Kratie in Khmer, transcribed, and translated to English. One interview was conducted via Skype with the translator directly interpreting for the research team. All interviews conducted by the research team included the interviewee, an interviewer, and a notetaker, except in one case when a translator was also present. All interviewees were clearly asked for their consent before starting. The interviews lasted 40 to 90 minutes and were recorded with consent.

Transcripts were written either for relevant sections of interviews or entire interviews. The deductive interview analysis was based on pre-defined themes and subjects drawn from previous research. An inductive analysis followed to identify subthemes and new subjects which arose during the interviews. These first two steps informed a concept-driven and data-driven coding process which would later be used to evaluate our hypotheses. MAXQDA (2019) allowed for efficient coding, digital assignment of categories to statements, and creation of new categories as necessary (VERBI Software, 2019). A code list is found in Annex 4: KII Code System. The digital analysis included coding along the main themes of the interview, either based on the interview guideline or emerging topics, thus allowing pooling of all data referring to the same code and identification of sub-themes.

4 Results

4.1 Socio-Demographic Characteristics of ILF Target Communities

The mean age of the respondents[4] (usually the household heads) in the sample is 46 years (see table below), with the youngest respondent being 23 years old and the oldest 83 years. The mean age of all household members is 27 years (n = 1,417), a comparatively young population structure, which resembles the national average of 26.4 years (National Institute of Statistics, 2018). Nearly 40 % of the household members are under 18 years of age (n = 564) and almost 10 % are infants aged zero to five years (n = 134).

Table 2: Means and Medians of Household Characteristics in Dar and Tipou

Variable	Total (n = 293)	Kratie (n = 143)	Kampong Thom (n = 150)
Age of household head (years)	46 ± 12	45 ± 12	47 ± 12
Male-headed household (%)	71	71	71
Married (%)	85	88	82
Household size (members)	4.8 ± 1.7	5.1 ± 1.8	4.6 ± 1.5
Literacy rate (%)	62	66	59
School years attended (years)	3.1 ± 2.9	3.8 ± 2.9	2.4 ± 2.7
Home garden possession (%)	95	92	97
Size of agricultural land (median in ha)	1.1	1.1	2.12

[4] We use the terms "respondents" and "households" to refer to the entire sample, i.e., members and non-members.

Variable	Total (n = 293)	Kratie (n = 143)	Kampong Thom (n = 150)
Active in self-employed agriculture (%)	80	73	87***
Total annual income (median in USD)	2,080	2,070	2,090
Total debts of indebted households (mean in USD)	2,060 ± 3,304 (n = 211)	1,674 ± 1,971 (n = 103)	2,429 ± 4,176 (n = 108)

Notes: Land recipients from both provinces are compared using a t-test *, **, and *** indicates 0.10, 0.05, and 0.01 significance levels.

The sample households, on average, comprise 4.8 members, consistent with the Cambodian average of 4.7 members (National Institute of Statistics, 2018) , with the smallest household comprising only one and the largest, eleven members. In the province of Kratie, the households are slightly larger than in Kampong Thom (5.1 and 4.6 members).

Around 71 % of the households in each province in the sample is male headed (n = 208). This is less than the national average of 78% male-headed households (National Institute of Statistics, 2018). Most of the respondents are married (85 %, n = 249; see Table 2), followed by widowed (11 %, n = 33), and divorced (4 %, n = 9) and only 0.6 % were never married (n = 2). Most of the respondents are of Khmer origin (99 %; n = 291); whereas only two households, both located in Kratie, belong to the Cham ethnic group[5].

4.1.1 Education

Around 62 % of respondents stated they can read and write (n = 182) with no clear differences between the provinces. Respondents completed an average of 3 years of school; in Kratie Province, this number was higher than in Kampong Thom (3.8 and 2.4; see Table 2). We found a negative correlation between the age of respondents and the number of school years they completed (τ = -0.27; $p \leq 0.01$),

[5] "*Cham constitute a minority group in Cambodia comprising between 1 and 2 per cent of the Cambodian population. Most Cham are Muslims and speak the Cham language. Long marginalized, Cham's situation has improved to some extent in recent years, though they still lack access to many educational and economic opportunities*." (Minorityrights.org, 2020)

indicating that the older an individual is, the lower their level of education is. There are also significant differences in educational levels by gender ($p \leq 0.01$) with men having attended school longer than women.

4.1.2 Possession of Agricultural Land and Home Gardens

About 96 % (n = 281) of respondents received an SLC. Of these, 78% received it between 2010 and 2012 and 12% between 2013 and 2015. The average land size held by a household in the sample is about 1.85 hectares. One respondent (from Kampong Thom province) stated to not possess any residential or agricultural land at all, while another (also in Kampong Thom) stated to own 14.6 hectares of land. As these outliers strongly distort statistical analyses, we used median land holdings in our analyses. For the entire sample, the median indicates land holdings of 1.1 hectares (see Table 2), which means that the sample is primarily composed of smallholders who, by definition, cultivate less than two hectares of land. For land recipients in Kratie, the average size of land holdings is 1.4 hectares, while the median is the same as for the entire sample (i.e., 1.1 hectares). In Kampong Thom province, the average size of land holdings is significantly larger at 2.31 hectares ($p \leq 0.01$). The median size is 2.1 hectares. Furthermore, most households own a home garden (95 %; n = 277) with only small differences between the two provinces.

4.1.3 Income

We found substantial variation in farm and household revenue across the total sample size. Around 80 % of respondents stated they were involved in income generation through self-employed agriculture (see Table 2), whether by the sale of crops, farm animals, or home garden products.

More than half of the households generate less than 10 % (n = 156) of their total annual income from agriculture, while only 5 % (n = 15) of the households in the sample generate more than 75 % of income from agriculture. Land recipients from Kampong Thom were significantly more likely to be involved in self-employed agriculture than those from Kratie (87 % in comparison to 70 %; $p \leq 0.01$).

The households in both provinces have around 2.3 different sources of income. About 58 % (n = 170) of sampled households create income through waged labor in agriculture. This share is significantly higher in Kampong Thom, where 67 % (n = 101) of sampled households are engaged in paid labor in agriculture, in comparison to only 48 % (n = 69) of households in Kratie ($p \leq 0.05$). More than one in five households (n = 64) owns a small shop, where they sell non-agricultural products and 18 % of land recipients (n = 52) work in construction.

The average annual household income for the entire sample was $3,947 U.S. dollars which is considerably less than the total average of Cambodian rural households ($5,577 U.S. dollars; National Institute of Statistics, 2018). For Kratie province it was $3,456 U.S. dollars, while for Kampong Thom Province it was significantly higher ($p \leq 0.10$) at $4,415 U.S. dollars. These results were distorted by some extreme outliers (with a total of seven respondents from both provinces claiming to have more than $30,000 U.S. dollars annual income). The median annual household income was $2,080 U.S. dollars for the total sample with negligible differences between the provinces (see Table 2).

4.1.4 Indebtedness

The share of indebted households has been relatively constant over the last six years (64–74 %). In our survey, a total of 212 household (72 %) held at least one loan. The average debt of those with at least one open loan was $2,060 U.S. dollars at the time of data collection, which is almost twice the number of the debts noted by GIZ in 2019 and more than five times the average debt noted in 2014/2015 (Table 3; GIZ, 2019). From these 212 indebted households, 158 (70 %) hold loans with a microfinance institute (MFI) and only twelve households (5 %) hold them with one of the ACs (three with AAC, nine with SASAC).

Table 3: Household Indebtedness from 2014 to 2020

	2014/15	2016	2017	2018	2019	2020-A	2020-B
Number of households	*889*	*813*	*1672*	*809*	*838*	*269*	293
Indebted households (%)	*73*	*74*	*64*	*67*	*70*	*74*	72
Debt per household (USD)	*374*	*615*	*782*	*868*	*1,181*	*1,614*	2,060

Source: Data in italics (2014–2020-A) were obtained from the ILF Food Security Survey (GIZ, 2020). The data from 2020-1 were collected in February 2020 (GIZ, 2020), whereas the data in 2020-B were collected as a part of the current study in October 2020.

The main reasons for indebted households to have taken up loans were for long-term investments, farming, or running their own shops (35 %; n = 74, multiple

answers possible) or to buy inputs such as seeds or fertilizers for crop production (36 %; n = 77). Less frequently, loans were taken for short-term benefits such as household consumption (22 %, n = 51) and health-related expenditures (19 %, n = 42). Twelve of the indebted households took a loan to repay another loan (4.1 %). Furthermore, 15 households (5 %) stated to have lost land to pay back loans; three lost at least half their land, four lost all their agricultural plots, and one lost its residential land too.

In Kampong Thom, the land recipients' average debt was 45 % higher than in Kratie (USD 2,429 and USD 1,674). Debt in indebted households in Kampong Thom was almost 55 % of their annual income, while it was about 48 % for those in Kratie. However, these values are distorted due to some extreme outliers with debts of $10,000 to $27,000 U.S. dollars. All households with debts higher than $10,000 U.S. dollars are also in the highest income quintile. The median for current debts is $500 U.S. dollars for both the entire sample and the sub-sample in Kratie, while it is $563 U.S. dollars for the sub-sample in Kampong Thom.

Interestingly, survey participants refused to answer the question about average interest rates (n=48) more than for any other question. Interest rates seem to be a sensitive issue.

4.2 Characteristics of the Agricultural Cooperatives

4.2.1 AC Structure

In March 2020, there were 80 members registered in the AAC in Kratie and 94 in the SASAC in Kampong Thom. The number of SASAC members has decreased by 57 members since 2018 (from 151 member households in 2018), while the number in AAC remained relatively stable with 77 member households in 2018.

During the last count in March 2020, about 47 % of the then 94 SASAC members were female (n = 45). In the AAC, the proportion of female members was 80 % (n = 64). Almost 47 % of AC members (n = 64) reported joining one of the two ACs between 2010 and 2015, whereas 46 % (n = 63) joined between 2016 and 2018 and only 10 households (7 %) joined between 2019 and 2020.

Both ACs have a Board of Directors (BoD) and a supervisory committee, in which the number of members has not changed since the registry of both ACs in 2018 (KIIs DAFF representatives). A DAFF representative from Kampong Thom described the tasks and responsibilities of the BoD as follows:

"The BoD has the duties to oversee every business- and communication related-tasks. The supervisory committee is the one who supervises every operation of the BoD to see if it follows the decisions of the general assembly or whether their expenses exceed the budget limitations allocated. This committee inspects the internal duties of the AC."

The positions within the ACs are honorary posts (KII Sok, GIZ). There is only a small annual payment to AC voluntary staff, which can be regarded as an expense allowance for the performance of voluntary work as summarized by Bartels, "*The volunteers only get around USD 5 to 15 at the end of the year for committee engagement*" (KII Bartels, GIZ). According to Wessel (GIZ), these conditions primarily stem from the low membership fees and pose a great challenge to the ACs' functionality. Bartels emphasizes that GIZ employees as well as AC representatives consider this a major obstacle and identifies that the

"...challenge lies in the amount of work and organization involved, with little compensation. The organizational effort is very high and requires a lot of time and strength of individual members, who then cannot cultivate their own land. This is quite a sticky point, which causes them a lot of trouble." (KII Bartels, GIZ)

A SASAC representative from Kampong Thom describes the BoD's roles and responsibilities rather as a loose association of volunteers: "*The secretary is the notetaker. Members also join hands. Here we don't really have specific or strict roles. Everyone comes and works together... For now, we work out everything together since we are still a small team.*"

4.2.2 AC Services

Saving and Credit

Saving and credit is the main service provided by the SASAC in Kampong Thom (KIIs Sok & Phat, GIZ). The importance of this service for SASAC members is confirmed by the quantitative data. Although just nine households in Kampong Thom claimed to hold current loans with SASAC, 82 % of the SASAC members stated to have originally joined this AC to access credit at favorable rates and 63 % (n = 41) of the members state they actually use this service.

The SASAC's monthly loan interest rate is 3 to 5 % (KII Sotha, Cambodian Farmers Association Federation of Agricultural Producers, CFAP). What makes borrowing through their cooperative attractive to SASAC members is that they do not need to provide land titles as collateral, which is usually the case with MFIs as iterated by the founder and managing director of CFAP, Sok Sotha, "*It is difficult to*

get loans for farmer members… They need something to deposit, like a land title, etc. Farmers are not in possession of this. This makes it difficult to obtain a loan." (Sotha, CFAP)

According to a SASAC representative, the amount of credit a SASAC member is entitled to depends on the number of shares owned. Sotha (CFAP) confirms this and adds that loans are rather small because they are financed by membership fees and the sale of shares.

Savings and credit programs are not used by a majority of AAC members. Only slightly less than one-fifth of the member households in Kratie surveyed stated they use this service (n = 14).

Contract Farming

For both ACs, contract farming constitutes a core element of their services. Land recipients can market their products via the ACs to contract buyers; for example, "*The marketing here means that the farmers sign contracts with the AC, so they sell their harvest to us, and the AC resells to the company"* (KII AC representative, Kratie). Contract farming arrangements exist primarily for cassava, for increasing amounts of cashew, black and white sesame, and mung beans.

Both ACs hold contract farming agreements with the Cambodian Agriculture Cooperative Corporation, Plc. (CACC) for the cultivation of organic cassava and with Signature of Asia Co. Ltd. (SoA) for the cultivation of organic mung bean and sesame (Sok, GIZ). In addition, SASAC signed a contract with Kamya Agritrade Co. Ltd. for the cultivation of organic cashew in 2019 (internal GIZ documents). These enterprises export the organic products to Asian, European, and American consumer markets (KII Chan, SoA; KII Grötschel, Kamya Agritrade Co. Ltd.).

Members participate in contract farming through their ACs because they often receive predetermined prices above the market rates as explained by a DAFF representative:

> "*Last year, there were less members but now it reaches over 60, who became part of the organic cassava production. Before, they sold their cassava to other private customers and sometimes they got a lower price than selling it directly to the AC. The AC, in turn, sells to the company who offers higher prices plus a premium*." (DAFF representative, Kratie)

Within such an arrangement, AC members may also receive seeds and other inputs on credit from contract partners, which they pay back after harvesting and selling their produce. "*We currently have a contract with a company to provide the*

breeding on credit. This is to attract more participants by on-credit breeding provision. They can repay after selling their yield" (KII AC representative, Kratie).

Organic Certification

Both ACs also provide services to facilitate organic certification. This service is also available to AC members and non-members in the provinces of Kampong Speu, Kampong Chhnang, and beyond (KII Sok, GIZ). *"The certification is for the community as a whole. Farmers must register for organic farming in order to farm under the certificate"* (KII AC representative, Kampong Thom). Currently cassava, black and white sesame, mung beans, and cashews are organically cultivated and marketed according to EU and US standards (KII Sok, GIZ). To ensure these standards are met by farmers, production is monitored by both external inspectors and the ACs' own control systems. *"There is a control system for the organic certification. We have local contracts for inspectors… The ACs in Kratie and Kampong Thom can now do this themselves"* (KII Bartels, GIZ). An AC representative from Kampong Thom adds that *"any member who uses chemicals will be disqualified"* (KII AC representative, Kampong Thom).

Agricultural Training and Extension Services

In ILF communities, land recipients have not necessarily always been farmers. They often lack experience in sustainable cultivation techniques, land management, and technical experience (KII Grötschel, Kamya Agritrade Co. Ltd.). Sok Sotha (CFAP), sees knowledge gaps as a big problem among Cambodian smallholder farmers and states, *"Farmers need special skills these days."* This lack of knowledge leads to failure to meet contract farming agreements criteria (KII Sok, GIZ).

Workshop participants in both Kratie and Kampong Thom agreed that agricultural trainings and access to agricultural inputs and equipment has generally improved, mainly due to efforts by development organizations and the ACs. According to the commune chief of Kampong Thom, the land recipients in the SLC program areas have better living conditions than others, especially when an AC is present. He argues that this stems from the educational and technical trainings from provincial departments and development organizations.

According to the HSS, the main agricultural training providers were the ACs followed by development organizations. Interestingly, the AC offered many trainings to members as well as non-members. Almost three of four respondents (members and non-members, n= 209) said they attended at least one training in the previous twelve months. A breakdown by AC members and non-members

shows that 82 % (n = 112) of AC members participated in agricultural training and 62 % (n = 97) of the non-members participated in the previous 12 months. AC membership correlates significantly with the number of attended agricultural trainings (rho = 0.26; p < 0.01).

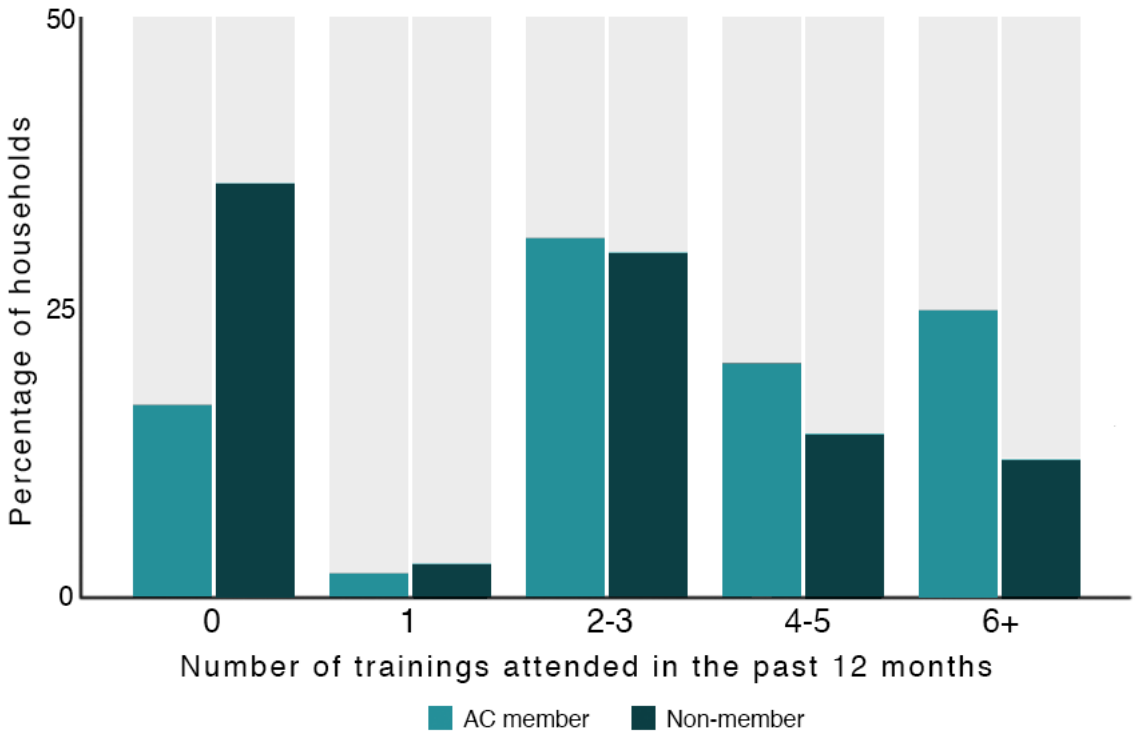

Figure 9: Trainings Attended and AC Membership

Training is also an important motivational factor to join an AC, inspiring 72 % (n = 98) of members to join an AC (multiple answers possible). Indeed, trainings are the AC service that AC members in Kratie and Kampong Thom make most use of (96 % and 71 %). Most surveyed AC members (n= 125) stated that their access to agricultural trainings has improved since they became a member of an AC.

Training courses are often not offered by the ACs themselves but by institutional partners such as the GIZ or the DAFF (KII Phat, GIZ). According to DAFF, trainings on vegetable gardening, livestock husbandry, and cassava planting have been provided to all AC members. In 2019, GIZ offered training on organic cassava production including cultivation, land preparation, organic fertilizers, and organic pest control in both provinces. Training in livestock husbandry and cultivation of vegetables, cashew, and cassava are also open for interested non-members. A training-of-trainers approach is used to train "key farmers", who

disseminate technical knowledge to the wider ILF target communities (KII Wessel, GIZ).

AC representatives receive training on leadership, management, processing, and value-chain development (KIIs Bartels & Phat, GIZ). The AC committees in Kratie and Kampong Thom received capacity development training on recording organic production costs.

Many workshop participants expressed a need for more and better-quality trainings on agricultural techniques. To improve accessibility, participants suggested sharing training documents with those who did not participate. AC representatives encourage farmers to become technical trainers, as this is an opportunity to tie members to the cooperative and spread knowledge within the community. Workshop participants in Kampong Chhnang suggested appointing a professional agricultural technician to support community farming activities and foster knowledge exchange. An AC representative from Kampong Thom told us that since 2017/2018, farmers are showing increasing interest in technical innovations' efficiency in both production and time. According to Wessel, the GIZ organizes ad hoc farmer-to-farmer training and farm field days to discuss production concerns.

Agricultural Input and Equipment

AC members receive agricultural inputs such as fodder, fertilizer, or seeds for their agricultural production. Fertilizer and seeds are primarily provided by the GIZ and not by the ACs. However, according to Sok (GIZ), the AAC in Kratie plans to open their own input store where members can purchase fertilizer and seeds at discounted prices. AC members also have access to agricultural equipment and transportation rentals via GIZ's donation of equipment and vehicles such as two-wheel hand tractors, threshing machines, and tuk-tuks to the ACs. These rented items generate income for the ACs (KII AC representative, Kampong Thom). In both ACs, about 50 % of the members make use of these services. As stated by a DAFF representative, *"these services are, however, still small in scale, which is why it has not been available to every member in time of need."*

Livestock Husbandry

According to representatives from both ACs, livestock and especially chicken farming is becoming increasingly important for income generation.

> *"In terms of livestock raising, there is a remarkable increase of about 80 %. We don't really have a shop or stand but more and more villagers raise animals at*

home. They now sell them to others from home or to the local market stands."
(AC representative, Kampong Thom)

To further expand this service to their members, both cooperatives are currently planning to purchase an egg incubator.

4.2.3 Social Livelihood Assets by Membership

Family and Social Networks

Being embedded in a social network with relatives, friends, neighbors, or other farmers strengthens a households' social capital. These networks are rather easily accessible and, therefore, represent an important support system.

Participants from the MAPP workshop in Kratie ranked *family* as one of their most important livelihood factors. Participants from Kampong Thom did not rank family as one of their top eight livelihood factors, but still reflected on its importance during the discussion.

Age and number of family members have strong influences on the division of the agricultural workload. Nearly 40 % (n = 564) of all 1,417 household members (AC members and non-members) are under 17 years old, 27 % (n = 383) of all household members are younger than 13 years, and about 10 % (n = 134) are younger than five. Having small children requires parents' time and labor, but as children grow older, workload is spread over a greater number of people as children start contributing to family labor, e.g., by taking care of younger siblings and livestock. More AC members in Kampong Thom are married (86 %, n = 65) and live in bigger households (4.8 persons per household) than non-members (79 % married, 4.4 persons per household).

Participants from the Kampong Thom workshop also ranked *internal migration* as an important social asset in their livelihood strategy. According to the workshop participants, migration to Phnom Penh to find work in e.g., the garment factories and support family through remittances is increasing.

AC Membership and Sense of Belonging

Workshop participants and interviewees indicated that being an AC member (or profiting from their services) has improved their livelihoods. AC members felt supported by services such as trainings, extension services, and rental services for agricultural equipment (KIIs Land recipients, Kratie).

Collective action gives people the opportunity to discuss options and find solutions together (KII Sotha, CFAP). During AC meetings, people raise concerns

and complaints (KII Land Recipient, Kratie/ AC Rep., Kratie), though some farmers reported feeling unheard, not being invited to all AC meetings, and not receiving as much information as their neighbors (Land recipient, Kratie/ Land recipient, Kampong Thom).

Trust is important in achieving a sense of belonging among community members (KII Bartels, GIZ). To strengthen trust and the sense of community, GIZ set up Food Security Groups (FSGs). The intention was to bring the people together and strengthen mutual support (KII Wessel, GIZ).

Leadership and Participation

Leadership is a crucial social asset that provides direction, inspiration, and guidance. The perception of leadership within the target communities differs among the interviewees. Some farmers feel that a clear structure and leadership is missing in their community. As one land recipient from Kampong Thom puts it, *"There has been too much change of structure in this community… the current leaders don't really share any information and don't really report to the top either."* An AC representative from Kratie agreed that providing leadership that meets members' needs is challenging: *"Members can share concerns and complaints and they have enough time for it. As a leader, we patiently listen to them and then explain… we explained, but they were still not satisfied after that".*

Key informants reported high levels of support from AC leaders and members, especially in times of need. A GIZ field officer provided an example of the dedication of some AC leaders: *"The AC committee sometimes also spends time to harvest for the households who are handicapped, who are widowed"* (KII Sok, GIZ).

The AC representative from Kampong Thom indicated that decision-making, project planning, and knowledge dissemination works best when members intensively participate in decision-making and meetings (KII AC Rep., Kampong Thom); however, the ACs struggle with decreasing participation (KII Sok, GIZ).

4.2.4 Human Livelihood Assets by Membership

Health

The workshop participants in both Kampong Thom and Kratie identified health as one of the three most important livelihood factors. A land recipient from Kratie explained health is his *"biggest struggle"* inhibiting him from farming.

Almost half of the respondents reported to have had at least one family member that suffered from stomachache (n = 140; 48 %) in the 30 days before the survey. 69

respondents (24 %) reported at least one family member had intestinal worms and 196 (67 %) reported at least one family member had fever in the previous 30 days. AC membership had no bearing on these results. But intestinal worm infections are more prevalent in Kratie (33 % of all households, compared to 15 % in Kampong Thom).

According to the workshop participants, access to healthcare (health centers, hospitals) has improved, but is still a challenge due to poor infrastructure (especially road conditions) and lack of qualified medical personnel: *"There is only a hospital building now, but no doctor works there… It [professional health care] would be very helpful for us here and more kids could go to school… I want the village chief to do a more serious job."* (Land recipient, Kratie)

An organic farmer from Kampong Thom told us that his family repeatedly had to spend a lot of money to cover his wife's treatment expenses, but being an AC member, he feels supported by the cooperative. He and another organic farmer from Kratie agreed that producing their crops organically has had a positive influence on their health. The ACs' rice banks and saving groups are perceived to have a high or medium influence on health as they can be used to obtain food or credit for medical services in times of need.

Education

While 70 % (n = 96) of all AC members are literate, only 55 % (n = 86) of non-members can read and write, though this difference is only marginally significant ($p \leq 0.10$). In Kampong Thom, the difference is more pronounced: 72 % (n = 65) of all AC members are literate but only 48 % (n = 85) of non-members.

AC members from both Kampong Thom and Kratie attended school on average longer than non-members. The average AC member has attended school for 3.7 years while non-members completed 2.5 years of school; this difference is statistically significant ($p = 0.02$). Only one in five AC members has never attended school (n = 28; 20 %) and this is true for more than one third of non-members (n = 53; 34 %). Farmers with more years of schooling are more likely to join an AC (rho = 0.21).

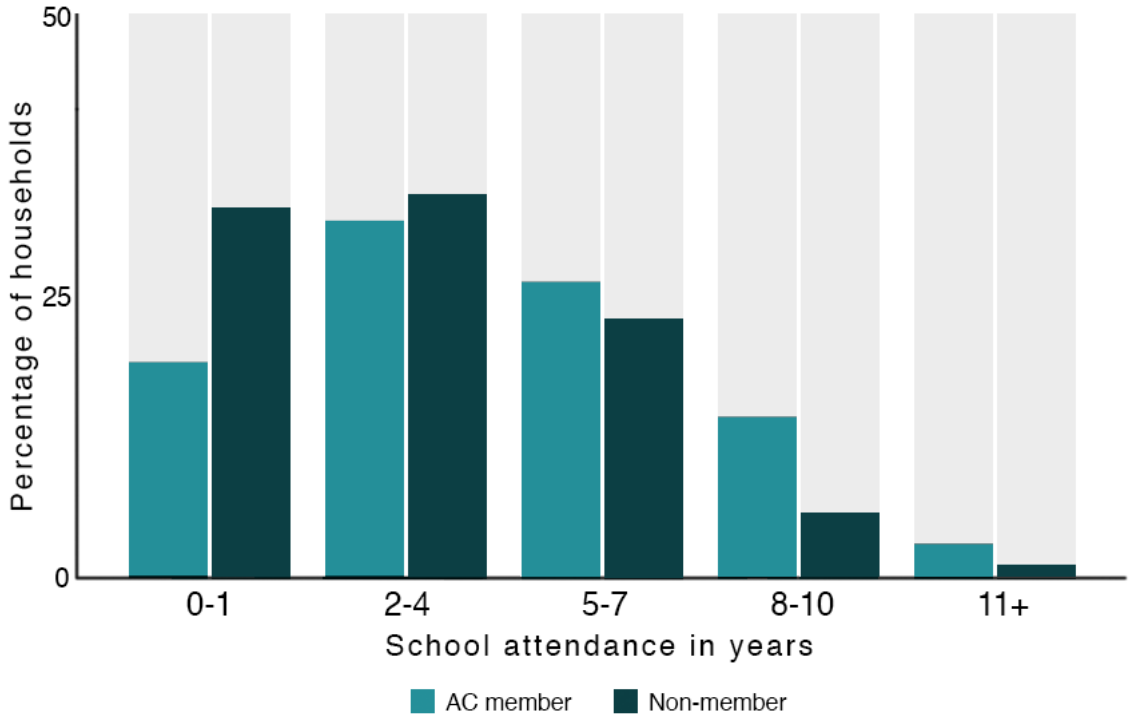

Figure 10: School Attendance and AC Membership

4.2.5 Natural Livelihood Assets by Membership

Land

Cooperative members initially received the same amount of SLC land as non-members (Table 4). The legally envisaged plot size for SLC recipients was 1 hectare in Kratie and 2 hectares in Kampong Thom, but the actual sizes slightly differed from these values (Table 4) with the average size of 1.0 hectares in Kratie (min = 0.1; max = 1.1) and 2.2 hectares (min = 0.1; max = 3.6) in Kampong Thom in 2020.

In Kratie, both members and non-members were able to increase the size of their original SLCs, although non-members were able to attain more land than members (0.5 and 0.2 ha respectively, $p = 0.04$; Table 4). Conversely, in Kampong Thom, non-members were more likely to lose part of their SLC (0.2 ha on average), whereas AC members gained half a hectare.

Only around 70 % of the non-members cultivated their land in the twelve months before data collection, whereas around 90 % of the members did so. In Kratie, non-members lived, on average, almost twice as far away from their agricultural plots as members ($p \leq 0.01$). In Kampong Thom, non-members lived

slightly closer to their plots, although this difference was not significant (p = 0.67; Table 4).

Table 4: Natural Assets by AC Membership and Province

Variable	Total Sample		Kratie		Kampong Thom	
	Non-Member	Member	Non-Member	Member	Non-Member	Member
Original SLC size (ha)	1.63 ± 0.80	1.61 ± 0.80	0.99 ± 0.28	1.08 ± 0.04	2.19 ± 0.72	2.27 ± 0.90
Land holdings at moment of survey (ha)	1.74 ± 1.74	1.98 ± 2.20	1.44 ± 1.19	1.28 ± 0.57**	1.99 ± 2.06	2.74 ± 2.96*
Changes in size of land holdings since SLC reception (ha)	+0.13 ± 1.73	+0.34 ± 2.04	+0.45 ± 1.29	+0.2 ± 0.58	-0.16 ± 2.01	+0.51 ± 3.01
Average share of land under cultivation (%)	71	92	74	88	68	97
Average walking time to agricultural plot (min)	64.6 ± 71.2	53.3 ± 57.3***	103.3 ± 79.7	65.3 ± 61.3***	32.7 ± 42.4	40 ± 49.6
HHs with year-round irrigation water (%)	2	15	2	10	1	21

Note: Means (±SD, n = 293) Cooperative members are compared with non-members within regions using a t-test, with significance levels: *** p ≤ 0.01, ** p ≤ 0.05, * p ≤ 0.10.

Irrigation Water

In Kratie, less than 10 % of both members and non-members claim to have year-round access to irrigation water. In Kampong Thom, only 1 % of the non-members claim to have access to irrigation water, whereas almost 21 % of the members do (Table 4). However, FGDs revealed that access to irrigation water has generally improved in both Kratie and Kampong Thom, mainly due to the construction of irrigation canals and large ponds (in Kratie).

4.2.6 Financial Livelihood Assets by Membership

Income Generation

A total of 80 % (n = 235) of the respondents generates part of their income by cultivating crops. For cooperative members, this number is a bit higher (85 %, n = 116) than for non-members (70 %, n = 109; Table 5). There is a positive correlation between cooperative membership and the likelihood of generating income from agriculture ($\rho = 0.19$; $p < 0.01$). In Kratie, a higher percentage of both cooperative members and non-members work in crop production than in Kampong Thom (85 and 94 % and 58 and 74 %). Furthermore, in Kratie, more cooperative members earn additional income through their home gardens than non-members, whereas in Kampong Thom province, this is the other way around (Table 5).

Table 5: Income Characteristics by AC Membership and Province

Variable	Total sample		Kratie		Kampong Thom	
	Non-Member	Member	Non-Member	Member	Non-Member	Member
Households that generate income from crop production (%)	70	85	85	94	58	74
Households that generate income from livestock (%)	21	11	20	10	22	12
Households that generate income from their home gardens (%)	53	46	31	33	71	60
Households that generate income from sources other than agriculture (%)	99	97	99	99	100	95

A high percentage of the member and non-member households across both provinces generates income through sources other than self-employed agriculture (95–100 %, Table 5). This means almost none of the households obtains income from agriculture only. The other main income sources are paid labor in agriculture, small and medium enterprises, businesses, and construction work. According to the PRA workshop results in Kratie and Kampong Thom, the financial situation has

generally improved over the last few years. By farming one's own land, the villagers depend less on wage employment, which PRA workshop participants in Kampong Thom saw as beneficial. Other livelihood strategies such as internal migration or wage labor often complement farming activities and contribute a major share of the household income.

AC members had higher mean and median incomes from crop production than non-members ($p = 0.05$, Table 6). On a provincial level, this difference is only significant in Kratie province ($p \leq 0.01$; Table 6). Members seem to spend more on agricultural inputs than non-members, although this difference is only marginally significant in Kampong Thom province ($p = 0.10$). Members generate income from livestock about half as often as non-members (see above, Table 5) but earn around twice as much income from it ($p = 0.01$; Table 6). The income generated from home gardening did not differ between members and non-members ($p = 0.64$) and was only $14 to 35 U.S. dollars annually (Table 6).

Table 6: Mean and Median Income by AC Membership and Province

Income variable (in U.S. dollars)		Total		Kratie		Kampong Thom	
		Non-Member	Member	Non-Member	Member	Non-Member	Member
Income from crop production	Mean	283 ± 61	592 ± 143**	137 ± 34	380 ± 46***	458 ± 124	882 ± 329
	Median	0	200	0	263	0	168
Expenses for inputs	Mean	144 ± 25	197 ± 25	113 ± 23	125 ± 15	180 ± 46	295 ± 52*
	Median	70	150	48	106	83	188
Income from livestock	Mean	101 ± 20	224 ± 44**	76 ± 25	222 ± 67*	123 ± 31	227 ± 55*
	Median	0	43	0	43	0	43
Income from home gardens	Mean	24 ± 7	28 ± 6	14 ± 4	24 ± 10	34 ± 11	35 ± 6
	Median	5	0	0	0	13	13
Gross income from agriculture	Mean	365 ± 62	828 ± 146***	207 ± 45	601 ± 73***	548 ± 121	1144 ± 331***
	Median	51	500	34	515	125	354

Net income from agriculture	Mean	233 ± 54	638 ± 134***	95 ± 49	484 ± 74***	398 ± 98	848 ± 299
	Median	13	313	0	325	38	218
Income from sources other than agriculture	Mean	2740 ± 385	4447 ± 292*	2486 ± 338	3810 ± 1132	2943 ± 638	5177 ± 1289*
	Median	1506	1800	1800	1800	1500	1825
Total income	Mean	2983 ± 384	5045 ± 909**	2567 ± 327	4333 ± 1310	3331 ± 650	5834 ± 1254*
	Median	1800	2500	1800	2628	1800	2488

Notes: "Gross income from agriculture" is the sum of income from crop production, livestock, and home gardens; "net income from agriculture" is the gross income from agriculture minus the expenses for input. Cooperative members are compared with non-members within regions using a t-test, with significance levels: *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.10$ (for means of the variables only).

The total mean income generated from agriculture is significantly higher for members than non-members ($p \leq 0.01$, Table 6), the same holds true for the median. Furthermore, households which are cooperative members generate more income from sources other than agriculture than households which are non-members ($p = 0.07$), resulting in a higher total income ($p = 0.03$; Table 6). Total income is largely attributed to non-agricultural income sources. Cooperative members, on average, have 1.4 different sources of income besides self-employed agriculture, whereas for non-members, this number is 1.3. While AC members generate about 24 % of their annual income from agriculture, this is true for only 14 % of non-members.

In the entire sample of 293 households, 61 households reported loss of income over the previous twelve months, which means that their income was lower than their investments.

Considering only the households that generated income through crop production, members earned more than non-members (Table 7). Member households which generated income through livestock had higher median incomes than non-member households. In Kampong Thom, members had almost double the median income from home gardens than non-members, whereas in Kratie there was no difference. The gross income generated from agriculture remains higher for members than for non-members. The net income from agriculture is higher for members too. In Kratie province, this difference is the most pronounced,

as non-members have a negative net income and members earn a median of $500 U.S. dollars annually (Table 7).

Table 7: Income by Sector, AC-Membership, and Province

Variable (annual income in U.S. dollars)	Total Sample		Kratie		Kampong Thom	
	Non-Member	Member	Non-Member	Member	Non-Member	Member
Gross income from crop production (USD)	500	500	188	500	925	475
Income from livestock (USD)	83	120	34	143	94	113
Income from home gardens (USD)	24	30	25	25	23	38
Gross income from agriculture (USD)	167	567	169	675	158	364
Net income from agriculture (USD)	15	319	-1	500	60	217

Notes: n = 293, gross income is the entire inflow or turnover from crop production, livestock, and home gardens, whilst "net income from agriculture" refers to the gross income minus the expenses for inputs.

Around 85 % (n = 117) of cooperative members consume at least part of their agricultural produce, whereas, for non-members this number is slightly lower (70 %, n = 109). However, members use a smaller part for their own consumption (27 %), sell more via AC-coordinated contract farming schemes (10 %), sell more directly to the ACs (38 %), and sell less to other middlemen (39 %) than non-members. Among the non-members, 33 % consume all the produce themselves, 16 % sells it on local markets, none participates in a contract farming scheme, and more than half (52 %) sell it to middlepersons. Around 74 % of AC members (n = 101) stated that they can sell their agricultural produce better since they joined the cooperative, whereas 17 % say they did not notice a change and 9 % do not know.

Correction for Potential Selection Bias

Cooperative membership is unlikely to be randomly distributed within a population of farmers because smallholders that choose to join a cooperative and those who do not may differ as a result of given preconditions (see Chapter 3.2.1). The results for correction for the resulting bias are shown below.

Table 8: Probit Regression Estimating the Propensity Score of AC Membership

Variables	Marginal effects	Standard errors
Household head is male	-0.10	0.34
Household head is married	0.03	0.50
Number of household members	0.26**	0.10
Age of household head	0.04***	0.01
Years of education of household head	0.22***	0.06
Ownership of motorbike	0.35	0.45
Ownership of cattle	0.34	0.31
Walking time from house to plot	-0.01***	0.00
Size of land cultivated in the past 12 months	-0.04	0.09

Note: applied to the dataset from both provinces. Significance levels: *** p ≤ 0.01, ** p ≤ 0.05, * p ≤ 0.10.

Households with a higher number of members are more likely to belong to an AC (Table 8). Every additional household member increases the chance of being in a cooperative by 26 %. Additionally, households with older household heads and with higher levels of education have a higher probability of belonging to an AC as well (Table 8). The estimated marginal effects indicate that an additional step (of three years) in the education of the household head increases the likelihood of cooperative membership by 22 %. Furthermore, we found that living further away from the plot reduces the likelihood of being a cooperative member with every additional minute of walking time decreasing the likelihood of cooperative membership by 1 % (Table 8). Other variables such as gender and marital status of the household head, the ownership of a motorbike or cattle does not have a

significant impact on the likelihood of cooperative membership (Table 8). Additional variables as the ownership of a phone, smartphone, or computer; household head's years of farming experience; access to irrigation water; and walking time to the nearest market and the nearest road did not show significant effects on the probability of cooperative membership.

Table 9: PSM, Agricultural Income by AC Membership and Province

Variable (annual income in U.S. dollars)	Total Sample		Kratie		Kampong Thom	
	Non-Member	Member	Non-Member	Member	Non-Member	Member
Net agricultural income	218 ± 115	527 ± 115**	199 ± 80	390 ± 80**	293 ± 264	716 ± 264*
Total income	3005 ± 1115	4708 ± 1115*	2762 ± 1614	4301 ± 1614	3113 ± 1556	5004 ± 1556

Note: n = 206, Kratie n = 117, Kampong Thom n = 85. Means are calculated average treatment effects on the treated (ATTs). Cooperative members are compared with non-members within regions using a t-test, *, **, and *** indicate 0.10, 0.05, and 0.01 significance levels.

After applying the PSM method (see Chapter 3.2.1), the net agricultural income of the total sample size remains significantly higher ($p = 0.02$) for cooperative members (USD 527) than non-members (USD 218; Table 9). Disaggregated by province, this difference is significantly higher in Kratie Province ($p = 0.04$), whereas in Kampong Thom, the difference is only marginally significant ($p = 0.08$). Also, the total income of members is higher than it is for non-members ($p = 0.04$; Table 9). For both provinces separately, the total income does not show a significant difference ($p \geq 0.12$; Table 9). The calculated average treatment effects on the treated (ATTs) are consistent over the three different matching techniques, which is an indication of the robustness of the PSM estimates.

Cooperative members in Kampong Thom province have an annual agricultural income (USD 716) that is almost twice as high as that of members in Kratie province (USD 293, $p = 0.02$; Table 9). Cassava and cashew were the most important cash crops in the region. Rice is also widely cultivated but, as the marketed amounts are very low, is mainly cultivated for subsistence.

In Kampong Thom province, most smallholder famers cultivated cashew ($n = 44$; data not shown). More than half of them ($n = 26$; Figure 11), collected

income from this crop in the previous 12 months. In Kratie province, smallholder farmers also often cultivated cashew, although only 2 of the 35 smallholders collected income from this crop in the previous 12 months (Figure 11). Cassava cultivation was less popular in Kampong Thom than in Kratie (n = 11 and n = 44, respectively).

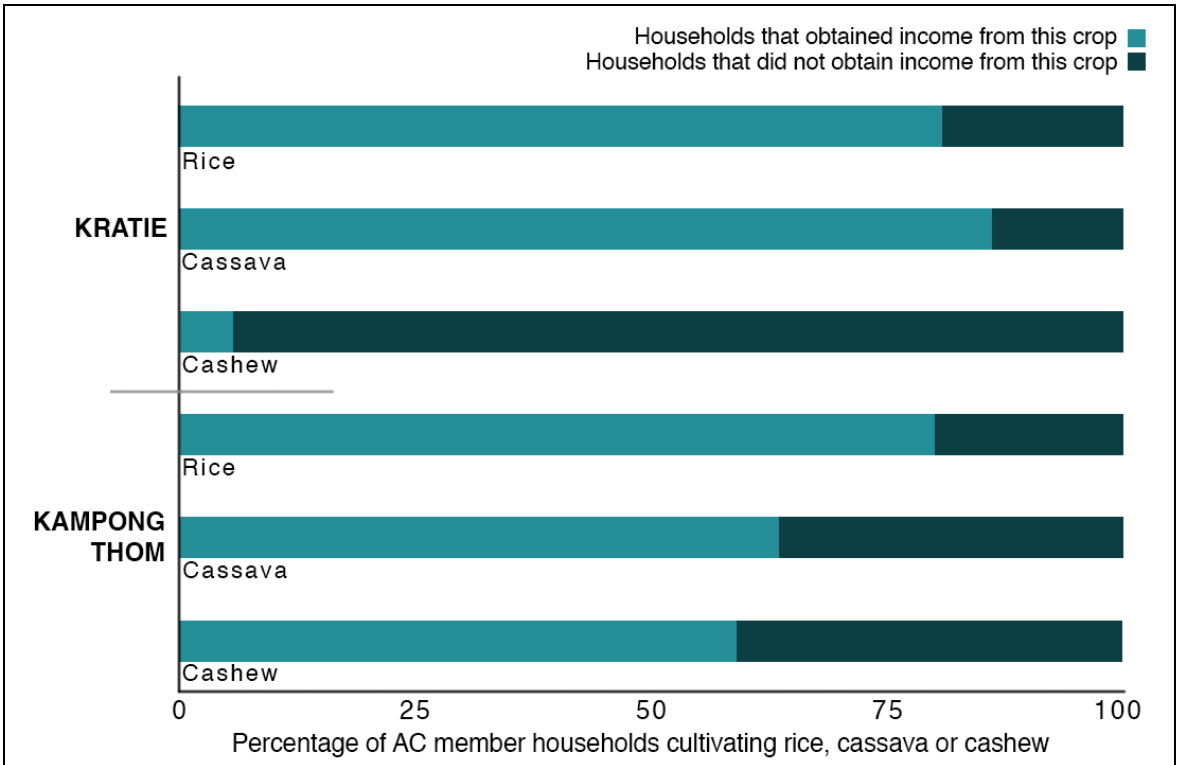

Figure 11: AC Member Households Cultivating Rice, Cassava, or Cashew

Notes: Percentage of cooperative households that cultivated rice, cassava, or cashew in the previous 12 months and obtained (blue) and did not obtain (black) income from it, in Kratie and Kampong Thom province, Cambodia.

Gross agricultural income is significantly correlated to the amount of harvested cashew ($\rho = 0.67$; $p < 0.01$) and cassava ($\rho = 0.33$; $p < 0.01$) but is not correlated with the amount of rice harvested ($\rho = 0.01$; $p = 0.90$). 46 % of the variation in gross agricultural income across the entire sample can be explained by the production of cashew and cassava ($R^2 = 0.46$, $p < 0.01$). While the production of cashew alone explains 44 % of the variance in gross agricultural income ($R^2 = 0.44$; $p < 0.01$), the production of cassava alone explains 11 % ($R^2 = 0.108$; $p < 0.01$). Per province, these numbers are slightly different. In Kampong Thom, the cashew harvest explains 49 % of the variance in gross agricultural income, while in Kratie, cashews had not yet been harvested. In Kratie, the cassava harvest alone explains the variance in gross agricultural income of 30 % ($R^2 = 0.304$; $p < 0.01$) and in Kampong Thom only of 9 % ($R^2 = 0.09$; $p < 0.01$).

Contract Farming

Market access through contract farming was used by one in four AC members in Kratie (data not shown). In contrast, in Kampong Thom, only 2 % of the AC members claimed to make use of contract farming services. A cooperative leader in Kampong Thom reported that the advantage of contract farming is that *"the selling price is guaranteed and usually up to 20 % above the market"* (KII AC Representative, Kampong Thom). A land recipient from Kratie added that the price is agreed upon before the harvest, which results in greater stability. Cassava and cashew, the two most important cash crops in the study sample, are often sold via contract farming schemes (KII GIZ staff, KII AC representatives). Most of these agreements unconditionally stipulate organic production of these crops.

Organic Farming

Around 19 % of the AAC members and only about 2 % of the SASAC members reported practicing organic farming (data not shown). However, several KIIs revealed that this production method is on the rise and that control measures for organic cultivation increase. A land recipient from Kratie reported that he is not only cooperating with the cooperative and *Signature of Asia* to produce organically, but that he is responsible for registering farmers and controlling the organic quality of their products. Another AC member explained that he supervises farmers during organic production and advises cooperative members against chemical use. Organic farming is not perceived as beneficial by all members, mainly because it is highly labor intensive. A land recipient from Kampong Thom stated:

"People who cultivate with using chemicals work less hard and faster than us. The income or profit is not much different. But we spend much more and it is still not enough as I mentioned. It needs so much physical strength."

Another land recipient from the same province claimed:

"For conventional chemical farmers, it's easy: they can simply use chemical inputs. Furthermore, they only spend about 50-60K riels for the chemical inputs on one hectare of land, compared to about 500K riels that organic farmers need to spend per hectare."

Credit

The number of households that hold loans is slightly higher in cooperative member households than in non-member households (80 % and 66 %); this trend is also visible in both provinces separately (data not shown). Most households hold

loans with microfinance institutions; for members, these percentages are slightly higher than for non-members (55–63 % and 47–52 %). The second largest credit provider is a bank (1–10 %) and the third is a relative, a source which is slightly more often used by non-members than members (4–11 % and 2–10 %). Around 14 % of the cooperative members in Kampong Thom (n = 9) hold loans with the cooperative, whereas in Kratie this is just 3 % (n = 2).

Cooperative members are more indebted than non-members, with a higher average of number of loans ($p \leq 0.01$) and a higher average amount of debt ($p = 0.03$; Table 10). The amount of debt of AC members in Kampong Thom is, on average, more than twice as high as for members in Kratie.

Table 10: Number and Amount of Loans by AC Membership and Province

Variable	Total sample		Kratie		Kampong Thom	
	Non-Member	Member	Non-Member	Member	Non-Member	Member
Number of loans	0.87 ± 0.06	1.21 ± 0.09***	0.89 ± 0.10	1.26 ± 0.14 **	0.85 ± 0.08	1.15 ± 0.10***
Total amount of indebtedness (U.S. dollars) *pre-correction*	1541 ± 209	2532 ± 389**	1332 ± 256	1926 ± 279	1716 ± 319	3197 ± 750*
Total amount of indebtedness (U.S. dollars) *after correction*	1435 ± 531	2644 ± 531**	1232 ± 522	1991 ± 522	1853 ± 1132	3688 ± 1132

Notes: Number and means of loans before and after PSM; ±SD. Cooperative members are compared with non-members within regions using a t-test, with significance levels: *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.10$.

In the FGDs, Kampong Thom villagers mentioned their wish to access more credit to meet financial needs during the COVID-19 pandemic. The participants often receive financial support from development organizations but still lack resources for investments, especially for organic production. A representative of a local NGO as well as a village chief in Kratie stated that it is problematic that some smallholder farmers have loans that are several times the amount of their annual income, a fact which is confirmed by our data. As loan collateral, farmers often need to use land titles. If they are unable to repay the debt on time, they can end lose their land. Some farmers take out new loans to pay old debts. "*There is no strategy behind it,*

and they may end up in a so-called debt spiral" (KII, GIZ staff). However, the risks in carrying debt may still be beneficial provided the credit obtained is used for investments which generate income (KII with GIZ staff). The community seems to be aware of the problems some of the smallholders have with over-indebtedness. A commune chief in Kratie explains:

> *"We do not encourage them [the smallholder farmers] to take loans from the MFIs. Instead, we advise them farming on their allocated land plots, to become a member of AC, and to learn from other members who experienced all this already. This way we don't have to approve on collateral property of land."* (KII Commune chief, Kratie).

A local NGO officer also suggested obtaining loans from saving groups rather than from MFIs:

> *"Instead of taking a loan from an MFI, saving groups almost always offer better and smaller loans, they are much more flexible, they don't require land as a collateral deposit, and there is more forgiveness because you borrow money from people you know"* (KII NGO).

4.2.7 Physical Livelihood Assets by Membership

Infrastructure

The average walking time from a households' residential plot to the nearest road is four to five minutes, with no clear differences between cooperative members and non-members in both provinces ($p > 0.10$; data not shown). The road conditions are generally perceived as good. According to the enumerators' observations in 250 of the 293 households (85 %), the nearest road is in excellent condition. A spokesperson from the DAFF in Kampong Thom stated, *"The road conditions are better now. Unlike before, we had to depart from Tipou commune by the two-wheel tractors, but now we could just take our motorcycle. However, it would be much better to have a paved road."* In Kratie, FGD participants said that the road improved with support from the GIZ program. Participants in Kampong Thom stated that the villages' road condition had deteriorated in recent years due to high traffic density and was no longer accessible by trucks and other heavy transportation. In 2014, a new gravel road was constructed. However, during the rainy season, the villagers still have problems with access, especially during medical emergencies. Workshop participants suggested local authorities encourage villagers to financially contribute to road maintenance.

Housing

The respondent's main roofing material was corrugated metal sheets and their main wall material were wooden planks or boards. There were no clear differences in the quality of housing by membership status or province (data not shown).

WASH

The environmental externalities of sanitation, such as water contaminated with fecal pathogens, go beyond a single household and affect the entire community. Therefore, sanitation is considered a public good and the appropriate level of analysis for its health effects is the entire village, even if toilets are owned individually (e.g., Okullo et al., 2017). According to the HSS in the villages in Kratie, the practice of open defecation is much more widespread than in Kampong Thom. While in Kratie 44 % of the households (n = 143) practice open defecation in Kampong Thom, only 17 % (n = 150) do so. Non-members more often practice open defecation than members (35 and 24 %) and are also slightly more likely to only have access to a pit latrine with slab (16 % and 13 %). Vice versa, members more often have a flush toilet connected to a septic tank than non-members (58 % and 44 %). The correlation between AC membership and availability of basic or improved sanitary facilities is significant (rho = 0.13; p = 0.04). Our data suggest that the practice of open defecation has a strong and measurable impact on the health status of a rural community. And health is, as already stated above (Chapter 4.2.4) the *"biggest struggle"* for many farmers.

Worm infestation (a disease causally related to the intake of fecal pathogens; Bintsis, 2017) is more prevalent in Kratie: at least one person in 33 % of the households suffered from it, compared to only 15 % in Kampong Thom.

Ecological sanitation produces manure and is often suggested as a favorable solution for smallholder farmers. We conducted a small additional survey and found low acceptability rates for ecological sanitation (EcoSan) in rural Cambodia. For more details, please refer to Annex 5: EcoSan Household Survey.

In Kratie, the largest share of the respondents stated they practice rainwater catchment during the rainy season, whereas in the dry season, they purchase bottled water or use a public well (Table 11). There is no significant difference in drinking water sources between members and non-members (p > 0.10). In Kampong Thom, the largest proportion of the respondents uses private wells as a

main source for drinking water regardless of seasons. Cooperative members own private wells more often than non-members (Table 11).

Table 11: Main Sources of Drinking Water by AC Membership and Province

Variable	Total sample		Kratie		Kampong Thom	
	Non-Member	Member	Non-Member	Member	Non-Member	Member
Main source of drinking water in rainy season (%)	Private well (33)	Private well (34)	Rainwater (39)	Rainwater (40)	Private well (57)	Private well (70)
Main source of drinking water in dry season (%)	Private well (35)	Private well (41)	Bottled water (35)	Public well/ bottled water (35 % each)	Private well (60)	Private well (79)

PRA workshop participants from Kratie and Kampong Thom stated they have good access to clean water and that it has been of consistently good quality in the past. Still, they raised some concerns over access to clean drinking water in the dry season when they boil rainwater, use water from wells, or use ceramic water filters. Participants from the workshop in Kratie complained that water filters have been provided but do not work properly. Both communities would like to have wells closer to their homes.

Goods

Cooperative members own vehicles more often than non-members; for motorbikes and cars, this difference is significant ($p = 0.02$; Table 12). Members also own mobile phones and smartphones more often than non-members ($p = 0.08$ and $p = 0.10$). In our sample, age of the household head does not influence household smartphone availability.

Table 12: Household Assets by AC Membership

Asset	Non-member	Member
Bicycle	42	51
Motorbike	78	88**
Car	1	5**
Two-wheel tractor	20	18
Four-wheel tractor	1	1
Radio	10	10
TV	32	41
Mobile phone	60	69*
Smartphone	53	62*
Computer	1	1

Notes: Cooperative members are compared with non-members within regions using a t-test, with significance levels: *** p ≤ 0.01, ** p ≤ 0.05, * p ≤ 0.10.

Access to Agricultural Equipment

Around 67 % of the surveyed households claimed that their access to agricultural technology has increased since they joined a cooperative. This was confirmed in the FGDs where participants stated that their access to agricultural equipment has improved over the years. Participants from Kampong Thom said that rental services for tractors and water pumps are now available to farmers, both members and non-members. An AC member from Kratie stated that "*non-members can rent vehicles and machinery, like a tuk tuk for transportation, plowing machines, threshing machines and tractors"*. This facilitates transport to markets and generates income for the AC.

It is the cooperatives' responsibility to maintain and repair the equipment. SWOT workshop participants criticized the poor quality of donated equipment, especially given the difficulty in finding spare parts and skilled technicians. The participants suggested the AC should reinvest the equipment rental income in maintenance and repair. In Kratie, the SWOT participants complained that the provision of agricultural equipment is insufficient and does not meet the specific needs of the community. In contrast to the findings of the MAPP workshops, the

SWOT participants questioned their fellow villagers' qualifications to properly use the machines. In Kampong Thom, the participants stressed that while transportation costs have decreased due to contract farming, they still lack adequate means of transportation.

Access to Inputs

Participants in Kampong Thom stated that the AC helped to reduce agricultural input costs and enabled input purchases on credit. They are satisfied with the quality of agricultural inputs. They complained that organic cultivation was time consuming and requested training on organic crop management practices which require less physical labor.

Fertilizers and seeds are provided to AC members mainly by the GIZ. Workshop participants complained that the supply of fertilizers and seeds does not meet the demand of all AC members and that inputs delivered out of season are difficult to store (leading to loss). Nevertheless, the ACs aim to increase the supply of agricultural inputs by purchasing inputs from more suppliers to both members and non-members and expand this service to other communities.

4.2.8 Food Security of AC Members and Non-members

According to the Food Security Framework of the FAO (2006) four dimensions of food security can be analyzed separately: 1) availability, 2) access, 3) use and 4) stability. As a result of our data collection process, we focus our analysis on the first two dimensions and discuss "food use" only with regard to home gardening. Our data do not allow us to produce results for the fourth dimension "stability", which is a limitation of this study.

Food Availability

The *Food Insecurity Experience Scale* (FIES) indicates that the prevalence of 'moderate or severe' food insecurity for AC members is 15 %, compared to 24 % for non-members. The prevalence of severe food insecurity is 0.2 % for members and 0.5 % for non-members (Annex 6: Supplementary Data).

A look at the different levels of food security (Table 13) shows members are more food secure than non-members.

Table 13: Food Security Status by AC Membership

Food security status (in %)	Non-member	Member
Food secure	35	46
Mildly food insecure	46	41
Moderately food insecure	17	12
Severely food insecure	1	2

Among member households, food security is 10 % higher than among non-member households. A cooperative member from Kratie confirms that his household's food security has improved since joining the AC, *"Since we started growing the crops with the cooperative, things have been better. We have many different types of crops, and the production went well. So we are less worried about food now."*

Around 61 % of non-member respondents reported worrying about not having enough food in the previous 12 months, whereas only 48 % of member respondents did (p = 0.04).

Food Access

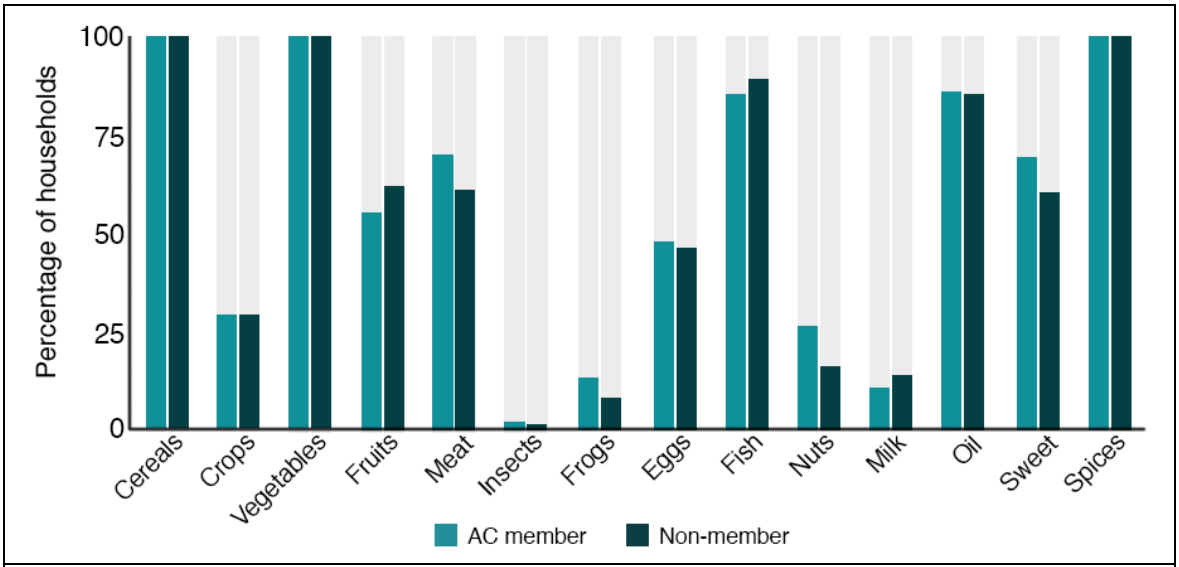

Figure 12: Food Types Consumed by AC Membership

We surveyed AC members' and non-members' food consumption in the 24 hours prior to the survey.

Within the limited study time frame, it was not possible to compare food consumption patterns across the Cambodian seasons. The figure below shows a slightly higher consumption of meat, nuts, and sweets by members, whereas non-members ate more fruit and fish, but generally the consumption patterns are strikingly similar. Thus, AC membership does not significantly influence a household's access to a variety of foods.

Food Use and Home Gardens

Home gardens in Kratie and Kampong Thom are diverse and not strictly organized. The GIZ supported their development under the "Food-for-Asset-Program" (KII Bartels, GIZ). The HSS indicates that respondents who have a home garden consumed a greater diversity of food than respondents who do not have a home garden (Figure 13). In turn, respondents without a home garden consumed more meat, eggs, fish, and sweets.

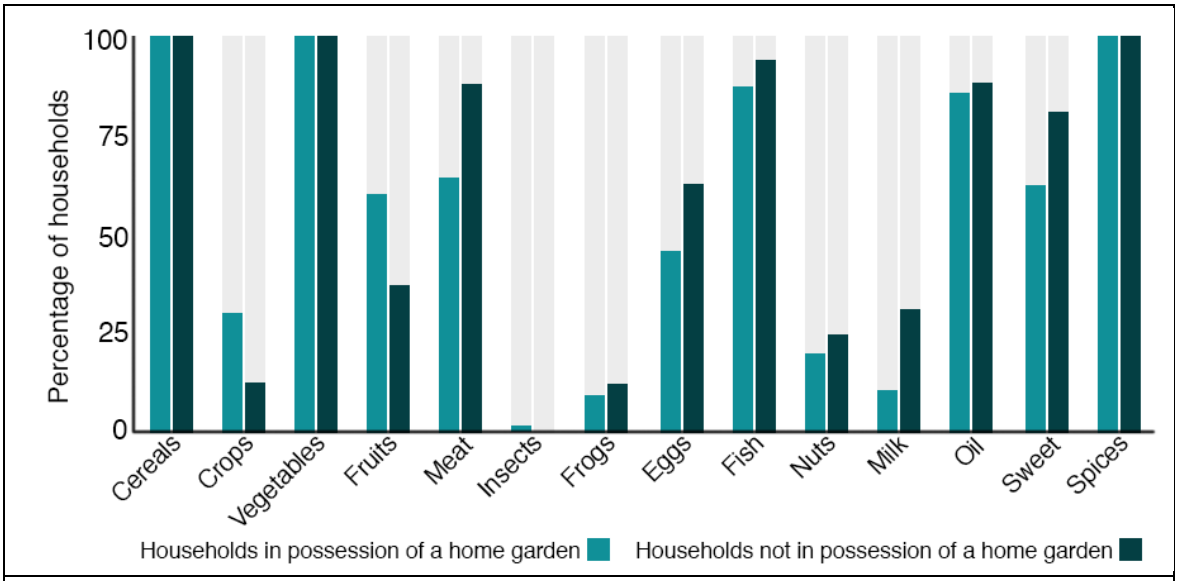

Figure 13: Household Food Diversity by Home Garden Ownership

Note: Households owning a home garden: n = 277. Households not owning a home garden: n = 16.

Of the respondents who have home gardens (n = 277), 1 % (n = 2) claimed not to consume anything from their garden, 3 % (n = 7) consumed one to two types of

food, 35 % (n = 96) consumed three to five types, and 62 % (n = 172) consumed six or more types of food from their gardens in the previous 24 hours.

Furthermore, 85 % of the respondents (n = 293) claimed that their diet became more diverse since starting a home garden, 4 % said they eat a less diverse diet, 8 % did not notice a change, and 3 % did not know. The finding that home gardening leads to a more diverse diet was echoed during KIIs (KIIs Grötschel, Kamya; Wessel, GIZ; Bartels, GIZ; Land recipients). Land recipients explained this diversification in various ways:

> *"It is a huge difference to my previous homeland. Now, it's handy and convenient if I want to eat any fruits, vegetables, chicken, or duck. I grow mango, papaya, jack fruit, custard apple, coconut."* (KII Land recipient Kampong Thom).

"I grow mango, custard apple, coconut … I eat a lot of things, more than enough. We eat more ourselves than we sell." (KII Land recipient, Kratie).

In addition, interviewed land recipients mentioned that since most households have home gardens more local, fresh, and seasonal produce is marketed in the neighborhood. A home gardener said: "*The villagers bought vegetables directly from my home."* (KII Land recipient, Kratie). In Kampong Thom, a land recipient reported selling his home garden produce only when demand and prices on the local market are high. The income from home gardens is not substantial, *"but home gardens do increase food security for rural communities,"* the CFAP representative summarized.

4.3 Social Inclusion

4.3.1 Member Participation and Withdrawal of Membership

The Norwegian Agency for Development Cooperation (Norad) established a checklist to analyze participation in development (Norad, 2013). The checklist gives an overview of who participates, in what way, and for what reason. We used this checklist to assess the communities' satisfaction with the ACs' commitment and accessibility.

Participation in Decision-Making Processes

When asked about ways they interact with their AC, 33 % of the responding members in Kratie (n = 24) and 31 % of the responding members in Kampong Thom (n = 20) stated they take part in meetings regularly. AC meetings are held once or

twice a month to share news, identify and discuss current problems, and plan future activities and investments.

A much higher rate (86 %, n = 118) of the interviewed AC members indicated they attend the annual general assembly regularly. Often the Provincial or District Agricultural Department joins this event (KII Phat, GIZ). In the assembly, AC representatives present the annual report and annual balance sheet. Members discuss how to share the dividends and approve new members (KII Sok, GIZ).

Participants in the SWOT workshop in Kampong Thom emphasized that the AC struggles with inactive AC members. This is partly due to the high opportunity and transaction costs involved in meetings or simply due to miscommunication. An AC member from Kampong Thom indicated that he missed a lot of important information as he was not invited to meetings, was unable to join, or he was not at home to receive the meeting hand-delivered invitation. Nevertheless, 80 % (n = 110) of the AC members said they participated in AC decision-making processes, with 22 % of respondents saying they participate often, 58 % saying they participate sometimes, and 20 % saying they never participate.

83 % (n = 114) of the AC members agreed that the decisions taken by the cooperative generally correspond to their personal needs, while only 6 % disagreed, and 11 % were neutral in their opinion.

These rather positive findings from the HSS are inconsistent with the views of the AC representative from Kampong Thom who stated, "*Participation is the hardest job. Fewer and fewer people attend the meetings or the trainings. It's hard to make a decision, to plan, or to promote necessary knowledge for them all. We need their participation for decision-making.*"

One member reported that he feels that their demands often remain unfulfilled by the AC but feels bad about complaining and blaming the AC as the mostly volunteering AC staff members put in a lot of effort.

Decisions are usually made by simple raise of hands during AC meetings. In the words of an AC member from Kratie: "*They told us about farming vegetables, chicken raising, saving, and so on. Then we could raise hands for 'Yes' or 'No'. If we don't want, then just tell them straight away like that*" (KII Land recipient, Kratie).

Beyond meetings, the AC leader travels to members' homes to inform them about news; however, knowledge-sharing is perceived as unequal:

> "*I received some info, but it seems to be not as much as others; others know different things from me, it's not the same information for everyone in the*

village. For example, when there is a donation coming in, I did not know anything about it, but people on the other side of the village did. It's not equal" (KII Land recipient, Kratie).

The DAFF representative from Kratie proposed the installation of a public information board; however, problems of illiteracy remain.

During the SWOT analysis in Kratie, AC representatives discussed ways of motivating more members to engage in planning and organizing AC activities. They suggested providing more technical assistance, crop varieties, and capital so members could increase their profits. Sok (GIZ) recommended transparent communication and organization: "*If they organize something, even if they make a contract with the company, they have to inform the community, to let them know. And if the committee has a lot of funding, they want to know where the money goes*" (KII Sok, GIZ).

Collaboration, Solidarity and Sense of Belonging

Many interviewees highlighted the importance of clear communication and transparency between all involved parties as important factors for collaboration. A common understanding of the AC system and structure would lead to a higher degree of understanding, trust, and sense of belonging (KII AC representative, Kampong Thom). "*The farmers understand step by step, some never understand. The system is not 100 percent satisfying for all the members, but 80 percent trust the AC and see the benefit"* (KII Sok, GIZ).

A GIZ officer gave examples of how the ACs build trust among their members: they occasionally voluntarily help with weeding, share snacks, harvest for labor-constrained households (e.g., disabled, elderly or widowed), and visit their members to "*understand other community members"* (KII Sok, GIZ).

Motivation to Join and Retention Strategies

The most common reason members joined an AC was to receive agricultural training (72 %; n = 98). Almost half of AC members joined to access loans (49 %; n = 67) or inputs such as seeds, fertilizers, or pesticides (47 %; n = 64). Other reasons supplied were better access to markets (23 %; n = 31), better access to agricultural equipment (17 %; n = 23), and support in the production and certification of organic produce (15 %; n = 20). Contract farming arrangements received less attention with only 8 % of the AC members (n = 11) being motivated to join the AC to access these services.

Figure 14 (next page) visually summarizes the reason members join the AAC and SASAC. While 86 % of the members in Kratie (n = 62) stated they joined the AAC to receive agricultural training, this only holds true for 55 % of the SASAC members in Kampong Thom (n = 36). In contrast, 82 % of the SASAC members (n = 53) said they joined to gain access to loans, while 19 % of the AAC members (n = 14) gave the same reason. In addition, access to contract farming and associated services such as improved access to markets and certification of organic products, played a much bigger role for AAC members than for SASAC members.

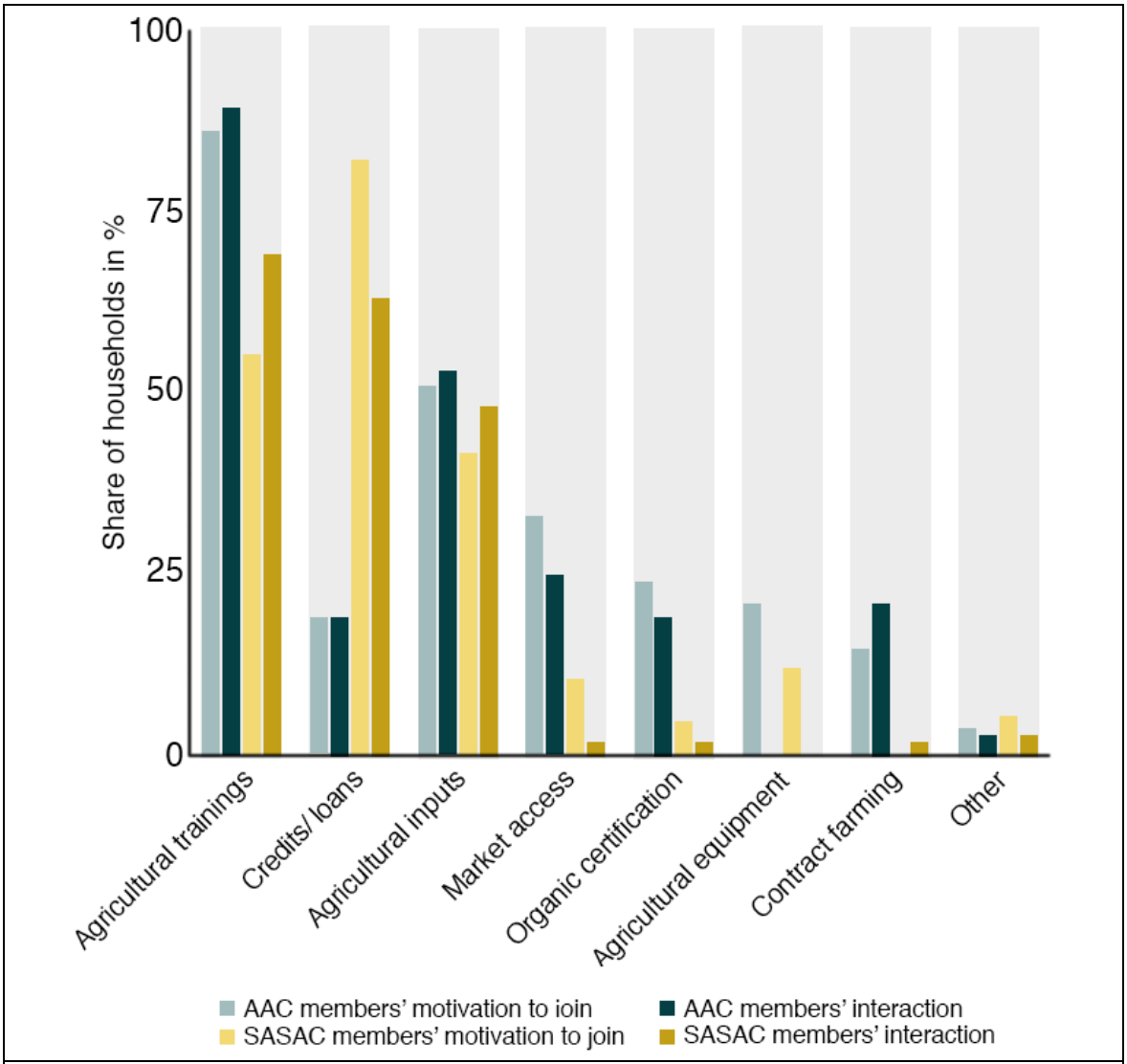

Figure 14: Reasons to Join an AC compared to Actual Use of Services

The HSS allows us to compare the services which attracted members to join an AC with their actual use of those services. For example, 82 % of SASAC members indicated they joined SASAC to gain access to credit, only 63 % used this service

(n = 41). Instead, members took advantage of more agricultural training than they originally intended (69 % versus 55 %; n = 45) and more accessed inputs (48 % versus 42 %; n = 31).

As an explanation as to why fewer members are using the SASAC credit/loan schemes, an AC representative and GIZ staff members provided details. Recently introduced regulations tie the amount of accessible credit to the amount of shares a member holds as explained by a SASAC representative: "*Members bought the shares because they wanted to borrow money afterward. Last year, there was a lot of buying of shares, because, in principle, those who buy a lot of shares are allowed to borrow 50,000 riel per share*" (KII AC rep., Kampong Thom).

A GIZ officer lamented that this led to an increase in the number of shares sold, but also to a decrease in the number of members (KII Sok, GIZ).

Refusal or Withdrawal of Membership

We asked non-members why they did not join an AC and the most frequently cited reason was lack of time, followed by membership fee, and unawareness of the ACs' existence. 19 % said they "feel bad" about not being a member, whereas 28 % felt "good", and 48 % were "neutral".

When asked, 67 % of former AC members stated they left the AC because of a lack of time (Table 14, next page). Other reasons given include lack of benefits (25 %), membership fees (17 %), and negative experiences (13 %). 39 % felt good to have left the AC, 29 % felt neutral, and 29 % felt bad. Non-members who took part in the contract farming scheme rated "insecurity" and "lack of information" as the most influential reasons for not becoming members.

Table 14: Reasons Former Members Withdrew their AC Membership

Reason	Percentage
Not enough time	67
No benefits	25
Fees	17
Negative experience	13
Distance	8
Loss of land	0

Organic farming, as promoted by the ACs, is seen as a deterrent to membership, particularly because it is perceived as labor and cost intensive. The strict rules during the initial phase of organic contract farming influence farmers' decision to avoid or disengage from their contract farming agreements (KII DAFF, Kratie) or the AC itself, as reported by a land recipient in Kampong Thom who said, "*I kind of think of leaving sometimes because they do not allow us to use chemical weed killer. It's expensive for us to hire people to kill the weeds because the [contract farming] company didn't help us with it*" (KII Land recipient, Kampong Thom).

This sentiment was repeated by an AC representative from Kratie who recognized the physical strength requirements for organic farming as a reason for disengagement; he confirmed, "*Most of them are cassava farmers with disabilities and widowers … I saw the same types of people tend to leave us one after another*" (KII, AC representative, Kratie).

One land recipient complained their income was lower than expected because the contracted harvest amount was not fulfilled: "*I only thought about it to myself… the price is a problem. It's disappointing when we couldn't meet the required amount of 500 tons*" (KII Land recipient, Kampong Thom). A land recipient from Kampong Thom reflected on the same issue and the related pressure that farmers feel from the AC and DAFF, "*Some farmers continue to plant and some just couldn't afford doing it this year. Therefore, we couldn't meet the demand and people from AC and DAFF blamed us all*" (KII Land recipient, Kampong Thom).

4.3.2 Equity and Discrimination

According to the DAFF, "*One of our main goals is to improve the livelihood of people in the community. We take care of everyone, even non-members, widowers, and such*" (KII DAFF, Kampong Thom). This policy of inclusiveness was echoed by an AC representative from Kratie who pointed out, "*When I met them [disadvantaged persons] in person, I talked to them and reassured that they know we welcome everyone in our activities no matter who they are: widowers, disabled people*" (KII AC representative, Kratie).

Traditionally underrepresented groups, such as women and disabled people, are encouraged to run for the BoD. An AC representative from Kratie described the AC's interaction with people with disabilities and the process of inclusion as follows:

> "*Everyone was included, and our jobs focus on them [people with disabilities] the most. In case of a family with a disabled member, we look at the other members who could farm. The same is true for families with very old members: their children could do the job for them. Before, we didn't have any kind of work*

suitable for disabled people. But in 2020, we are planning to set up an egg incubator service. I will welcome any farmer with a disability who applies, because this is less physical work for them." (AC Rep, Kratie)

The participants of the PRA workshops in Kampong Thom described the AC trainings as rather technical and demanding. People with a lower level of education experienced difficulties in understanding content. During the SWOT analysis, participants made a similar observation saying that the training delivery is too fast and there is no space for interaction. Often the participants perceive the trainers as unfriendly and do not feel comfortable asking questions.

The DAFF reported that most of the land recipients are illiterate, a statement which contradicts our HHS findings which suggest that literacy ranged from 55% for non-members) to 70% for members (Table 2).

"*The message they get from the training might not be used properly or in depth. We want them to know everything important, but it depends on their capacity to understand things too. If you invite them for a full day of training, they might think of selling their labor to survive the day rather than concentrate in class. You may have their presence in class, but they have weights on their minds"* (KII DAFF, Kratie).

The commune chief of Kratie suggested, the inappropriateness of the trainings is one of the reasons why many farmers have not adopted organic practices.

4.3.3 Inclusion and Exclusion from Services

78 % (n = 137) of surveyed member households indicated that all members have equal access to the services of the AC, 12 % disagree, and 10 % are neutral.

The trend analysis in in the PRA workshop in Kratie revealed that in recent years agricultural inputs (especially seeds from the GIZ) were not distributed equally among AC members. However, the data do not reflect which groups were excluded. Despite this, the participants feel well supported in quality seed provision.

Kampong Thom MAPP workshop participants stated that services are not equally accessible to all members, citing the example of machinery rental terms which gave some members discounts. Similarly, agricultural inputs were provided free of charge to AC committee members, but not to ordinary members. Workshop participants advocated for fewer privileges and more equal distribution of services and inputs to all members according to the same transparent rules.

4.3.4 Economic Inclusion and Exclusion

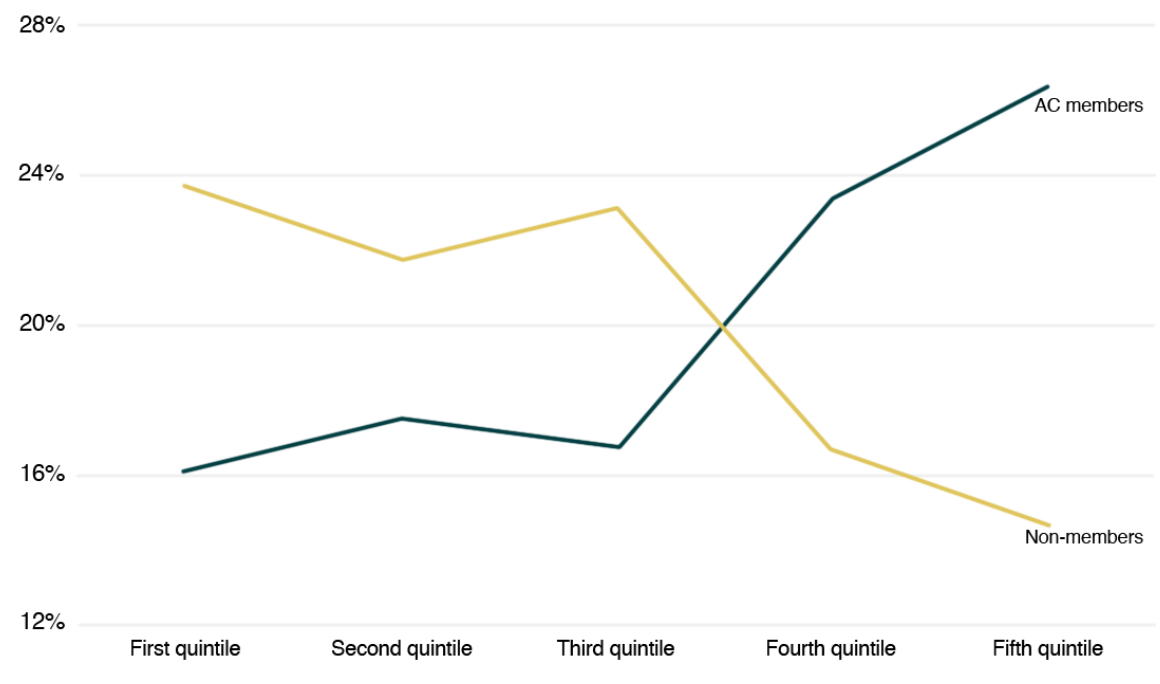

Figure 15: Income Quintiles by Membership Status

Note: Quintiles based on total annual household income. The first quintile represents the lowest income group and the fifth quintile represents the highest income group.

When looking at the income quintiles (total annual household income) of AC members and non-members in our sample (Figure 15), the majority of AC members are found in the two highest quintiles, i.e., the fourth (23 %) and the fifth (26 %), while non-members are in the first, second, and third quintile. 66 % of all AC members have at least an average or above-average income. 54 % of non-members belong to the group of average and above-average income.

Given that a completely equal distribution would result in 20 % in each quintile, the observed variations from 14 % to 26 % are rather small. Still, AC members are more strongly represented in the higher income groups, though 16 % of all AC members belong to the lowest quintile.

4.4 Local Knowledge Sharing in ILF Target Communities

The study identified several agricultural knowledge sources accessible in the target communities in Kratie and Kampong Thom as well as two villages in the Provinces of Kampong Speu and Kampong Chhnang where the ACs are active. We also asked workshop participants to suggest additional means and platforms for

the exchange of agricultural knowledge. The main findings are presented in the following.

4.4.1 Sources of Knowledge

All sources of agricultural knowledge mentioned in the workshops are shown graphically below. The columns represent the perceived importance of each information source; that is, the percentage of AC-member and non-member households making use of each source.

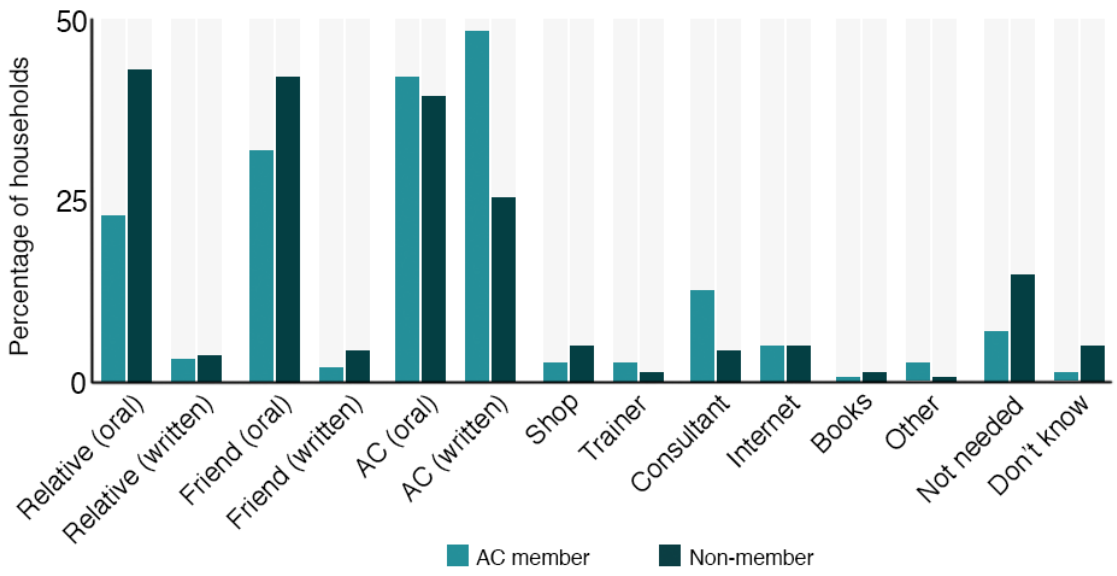

Figure 16: Sources of Knowledge and their Use by Membership Status

Note: Multiple answers possible.

The four sources of information most frequently used by members and non-members are word-of-mouth messages from friends, relatives, and the cooperative and written information from the cooperative. For AC members, clearly the AC is the most important source of knowledge; while for non-members, the AC is still relevant, but on a similar level as friends and relatives.

In the following sub-sections, we present our findings in more detail.

Agricultural Cooperatives

Up to 26 % of the surveyed AC members make use of verbal and written information provided by the cooperative (Figure 17,). 20 % of non-members also make use of information that ACs share verbally. In three of the four village workshops, the ACs were identified as the most important source of information and knowledge exchange (Figure 18, findings from the workshops in Kampong Chhnang and Kampong Speu are presented in Annex 6: Supplementary Data).

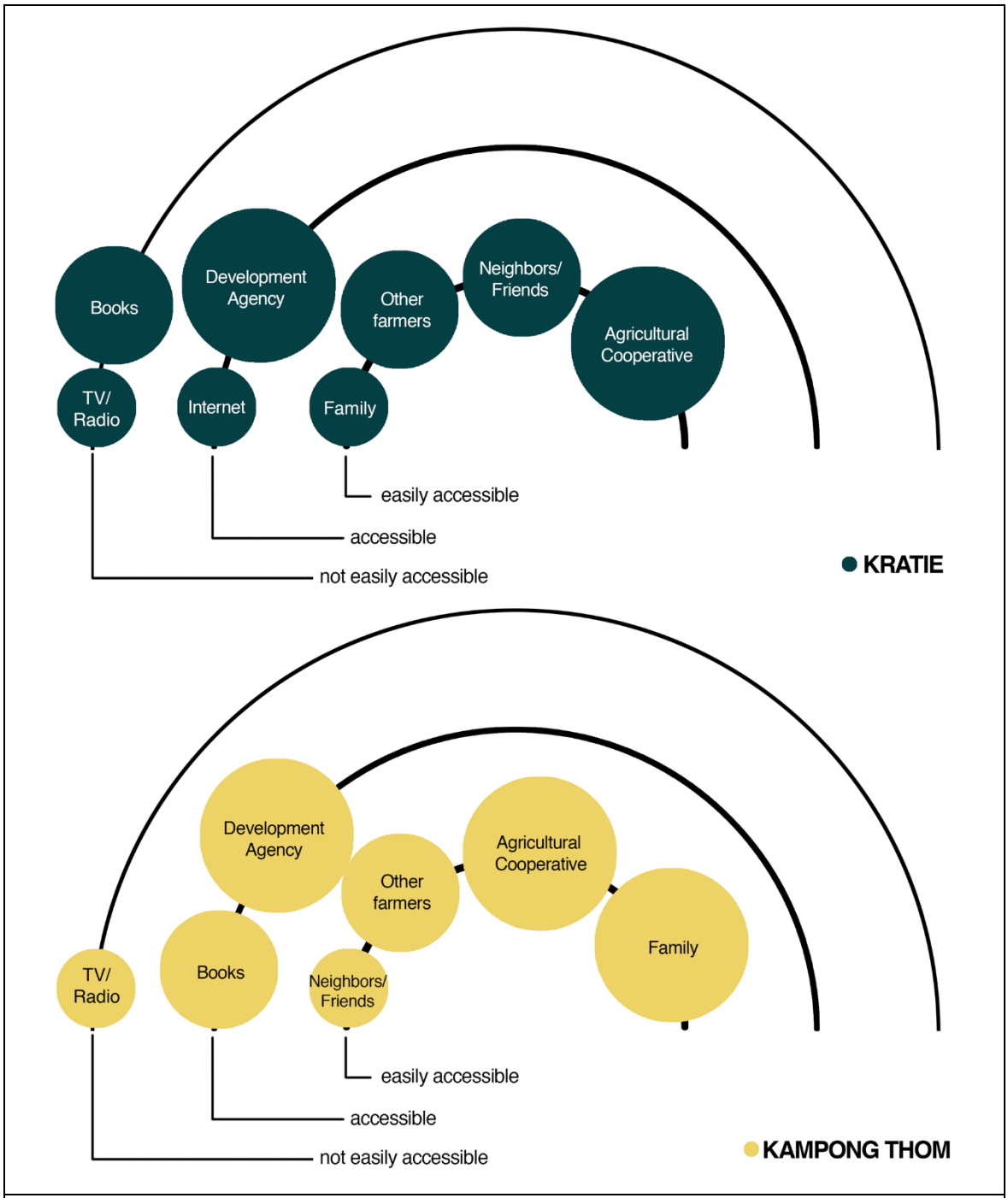

Figure 17: Importance and Accessibility of Sources of Knowledge

Note: Larger circles indicate higher perceived importance. Circles are ranked from easily accessible (center) to difficult (periphery).

While participants from Kratie, Kampong Thom, and Kampong Chhnang find ACs easily accessible, participants from the workshop in Kampong Speu find it more difficult to get in touch with their cooperative, probably due to the large distance between the two provinces. According to an AC representative from Kampong Thom, the ACs reach out to its more distant members by phone, announcement papers, and letters.

According to several land recipients and AC representatives, the main means of knowledge exchange between the ACs and their members are meetings, trainings, home visits, supervision of production, and consultation on cultivation. As an official from the DAFF in Kratie told us during an interview, the AC in Kratie divided its members into groups of four to five households and assigned a leader to each. The leader's task is to inform the rest of the group about important information shared by the AC. This way, people can stay informed even if they miss a meeting.

During a SWOT analysis, AC representatives from Kampong Thom emphasized the importance of the agricultural technical advice provided by the AC. Knowledge exchange visits to other communities are highly appreciated by AC members. An AC representative explained that model farmers from each village teach others and thereby disseminate agricultural knowledge within the community.

Social Environment

Another important source of information for the workshop participants is their immediate social environment, such as family, friends, neighbors, and other farmers. According to the HSS, family and friends are the most important sources of information for non-members, accounting for more than 40 % of the sample. For AC members, family and friends are the second most important source (≈ 30 %). The Venn diagrams show similar findings. Family is an important to very important and easily accessible source of information for participants in Kampong Thom, Kampong Speu, and Kampong Chhnang. Other farmers are a slightly less, but still important information source to participants in Kratie and Kampong Thom. Participants in Kratie and Kampong Speu consider friends and neighbors important to very important when asking for information. All four workshops show that the nearby social environment is easily accessible. One exception is Kampong Chhnang, where the participants stated they had difficulties communicating with other farmers, even though they consider them an important information source.

In the interviews, the land recipients in Kratie and Kampong Thom indicated that talking to neighbors and other farmers is very helpful for their work, not only in terms of agricultural cultivation, but also for keeping each other updated about current news and meetings in the village.

Development Agencies

All four Venn diagram workshops highlight the importance of development agencies (referred to as NGOs by the participants) for the provision of information

and training to the land recipients[6]. The results only differ in the levels of accessibility. While participants from Kampong Thom, Kratie, and Kampong Chhnang consider development agencies accessible, participants from Kampong Speu have difficulties reaching out to them.

Apart from the GIZ and NGOs, the Department of Agriculture, Forestry and Fisheries conducts agricultural extension services, several trainings, workshops, and other forums in the communities (KII DAFF, Kampong Thom).

Books and Media

From the more than 300 households interviewed, less than 5 % percent said they use books, TV, radio, or internet as sources of agricultural knowledge. The Venn Diagram (Figure 17) reveals why this is the case. Participants from all four target communities consider TV and radio difficult to access and therefore do not consider it an important source of information.

Books are ranked as a relevant source of information, but three out of four communities find them difficult to access. The DAFF representative from Kampong Thom told us, *"We wanted to create a library, but it depends on their literacy capacity. Some of them could not read."* The relatively high number of illiterate people is still an obstacle when developing the right means of sharing information and knowledge among villagers (KII DAFF, Kampong Thom and Kratie). Considering all aspects, books and other means of media are rather difficult for the participants to access and, hence, are not important sources for knowledge sharing.

The internet appears to be easily accessible by participants in two of the four workshops, but only participants from Kampong Speu think internet is of at least medium importance when searching for agricultural information. Participants remarked that the internet is only relevant to those who are literate, have smartphones, and who have an affinity for social media. As already shown in Chapter 4.2.7 AC members are more likely to have access to a smartphone (62 %) than non-members (53 %), though this result is only marginally significant ($p \leq 0.10$).

[6] During the MAPP workshops, several development agencies and programs were mentioned as cooperating partners in the villages. Among them were GIZ, LASED II, Cambodian Red Cross, Life with Dignity, Raw Impact, World Food Program.

4.4.2 Potentials for Sharing Local Agricultural Knowledge

During the Venn Diagram workshops, SWOT analyses, and KIIs, participants identified several potential ways for sharing local knowledge. A central finding was that they wish to foster knowledge exchange not only between farmers, but between communities.

Knowledge Exchange Between Generations

One way to promote the exchange of local knowledge is to foster the exchange among different generations. According to the GIZ staff, knowledge on local seeds and traditional farming techniques still exists among the elderly, but this knowledge is not passed on (KII Bartels, GIZ; KII Wessel, GIZ). Therefore, GIZ asked the elderly to act as advisors and to share their knowledge with the AC and the community (KII Phat, GIZ).

Transferring the knowledge from the elderly to the younger generation comes with challenges. A DAFF official from Kampong Thom shared his experience trying to involve the younger generation to become multipliers for teaching agricultural techniques:

> *"We have tried to engage the young generation who are at high school or graduates in this process. We wanted to give them technical trainings so that they could serve their communities, but so far, we have not yet been able to find one. We have tried to make changes slowly over time. Three to four years after they are well-aware of the ACs' work, they will serve their own communities."* (KII DAFF, Kampong Thom)

Digitalization

Although, both the HSS and Venn Diagram results show that internet is not a common source of information for land recipients, the KIIs underscored that internet access offers much potential to improve communication and knowledge sharing:

> *"I can access many news… using my phone… I got to know about how to grow something on YouTube…. just a month ago… I learned how to graft a lemon tree… I was amazed by how to graft it. Before we had to grow from seed and it took a long time. Now, it is just cutting a branch of it."* (KII Land recipient, Kratie)

Statements made during the KIIs suggest the target group can easily access social media such as Facebook or YouTube. One land recipient said, *"most people*

know how to use Facebook" and *"most of the youth or old adults have access to it"* (KII Land recipient, Kampong Thom). However, a DAFF representative admitted his frustration that internet websites do not attract as much attention as social media:

> *"My department has created a website. So far, we do not see clicks on it, even after a lot of promotion has been done. On the site, there is various information of which community sells what produce, and it's from across the country. You can also download various types of documents from there such as laws, growing techniques, but they didn't do it."* (KII DAFF, Kampong Thom)

Both land recipients and AC representatives agreed that using social media and other means of digital communication could improve communication between farmers and the cooperative. By sharing information and trainings online, ACs could reach many people at once and teach those who are unable to be physically present at their trainings (KII Land recipient, Kampong Thom). Farmers would save time and transport costs. One AC member also noted that, *"If we have that, it would be convenient. As we mentioned, they [AC staff] are exhausted, busy, and work without salary. It's too much for them to call and visit everyone"* (KII Land recipient, Kampong Thom). Still, ACs in the two provinces lack a specific plan to digitalize their work (KII AC, Kratie).

4.5 Factors for an Autonomous and Sustainable Operation of both ACs: SWOT analysis

Representatives and members of the cooperatives reflected on strengths, weaknesses, opportunities, and threats (SWOT) of their organization's internal structure and experts from partner organizations supplemented their observations in KIIs.

Strengths

According to the SWOT analysis, the large portfolio of services offered by the ACs is perceived as a strength. In SWOT workshops in Kratie and Kampong Thom, the provision of agricultural land, machines, inputs and better access to external organizations, companies, and authorities were listed as strengths. In addition, in Kampong Thom, participants described exchange with other communities, access to agricultural trainings, and access to marketing mechanisms as strengths. Participants in Kratie stated that the certification for organic, high-quality products creates access to new markets in Europe and the US. In Kampong Thom, the participants emphasized that it is easy to sell certified-organic goods and that they

have received recognition from their contract partners for their production. This ongoing process strengthens both parties' confidence in the transactions and creates stable relationships. In the SWOT in Kampong Thom, it emerged that contract farming plays a central role in accessing specific markets.

Newly formed support structures such as rice banks or saving groups strengthen social cohesion between the members, pool their capacities, and mitigate risks. Members in Kampong Thom also stated that the interest rates for loans secured via the AC are lower than from private lenders and no administrative fees are charged. Moreover, they feel more comfortable lending to the AC because the profits from their saving schemes stay in the village and strengthen the AC and the community at large over time.

Weaknesses

From both workshops, it emerged that a well-functioning management structure and committee needs to be established to develop business plans and strategies and to assure organic production quality standards. Participants at both workshops stated that the ACs' low incomes do not allow for scaling up programs (for example, the introduction of new crop varieties or investments in agricultural inputs such as seeds and livestock equipment). In Kratie, participants also stated that the number and amounts of loans provided by the AC do not meet members' actual demand.

The lack of agricultural knowledge among member households is also regarded as a weakness. Access to training plays a central role here, but participants in Kampong Thom indicated that some obstacles such as high opportunity costs to participation, top-down methods, and overly ambitious curricula prevent uptake of the information given in trainings.

In Kampong Thom, the participants stated that agricultural equipment available for rent through the AC does not meet members' demand and are often of poor quality or run down. They proposed that rental income be re-invested in the repair and maintenance of the machines.

Organic production of goods generally demands more time and labor than conventional methods, which is one reason why many farmers do not join the cooperative. In Kampong Thom, the SWOT workshop participants also mentioned their lack of financial resources for investments in organic production.

Opportunities

The expansion of high-quality varieties of organically produced goods may create access to new markets and clients, e.g., supply of restaurants or hotels. The SWOT workshop participants in Kratie suggested several aspects of the desired autonomous operation of their AC. New opportunities in contract farming were perceived as helpful to improve sustainability and to deepen knowledge of markets and prices. Also, the sharing of experiences and knowledge within the community and, as mentioned above, with other communities was perceived as a promising opportunity for both cooperatives. In Kampong Thom, participants also suggested establishing a community-level credit scheme.

Threats

Other factors threaten the future of the ACs and may hinder the full development of the ACs' potentials. External risks and shocks resulting from climate change (such as more frequent droughts and floods and new crop diseases), volatile market prices, and the impact of the COVID-19 pandemic on product export emerged as threats to the ACs during the SWOT in Kratie. In Kampong Thom, participants mentioned lack of compliance with organic certification protocol as a major threat.

Key Experts Reflections on SWOT Topics

The KIIs highlighted aspects of the ACs' internal organization and management, particularly the imbalance of tasks and responsibilities undertaken by uncompensated volunteer AC representatives (KII Land recipient, Kratie; KII Wessel, GIZ; KII Phalit, GIZ; KII DAFF, Kampong Thom). The recruitment and remuneration of skilled employees was perceived as a necessary step to strengthen management, build trust, create opportunities for scaling up, and decrease dependency on external support (KII Wessel, GIZ). A business partner who holds a contract farming agreement with one of the ACs described the situation as follows:

> *"Successful are those who have a good leadership structure. Those who have decided to take the right people as head, for admin/finance, and for the board; people who are behind it and understand what is actually in demand on the customer side."* (KII Grötschel, Kamya)

Trainings on management and equipment operation and maintenance as well as consultancy on political and legal matters were described as equally important (KII DAFF, Kampong Thom; KII Commune Chief, Kampong Thom).

The interviewees further stressed the importance of establishing a shared vision for the entire AC. This aspect is important for various reasons. First, creating a shared vision helps to clarify the ACs' benefits to members and non-members, as emphasized by a representative from the DAFF in Kratie. Second, the commune chief in Kampong Thom and the AC leader in Kratie stressed the importance of a shared vision to increase competitiveness and to proactively position oneself in the context of governmental development strategies (KII AC representative, Kratie; KII Commune Chief, Kampong Thom). Implicit in the visioning process is partnership building and joint planning public–private and civil society. The representative from the DAFF in Kratie emphasized the importance of public–private partnerships:

> "*Take home gardening as an example. It requires water, inputs, a willing farmer; all of which, we have the AC structure in place to do it. So, if the project is to extend, we should build a new irrigation system and lower the price of electricity. We should observe and assign the responsibility of each part to the AC's leaders. If AC improves their production capacity, the project could then connect them with the consumer companies. However, if the first contract farming is too strict, farmers might choose not to produce for the company."* (KII DAFF, Kratie)

Private sector partnerships were mentioned as a business-oriented growth strategy that could establish independence from external donor organizations. Developing new forms of cooperation and networking came up in many interviews (KII DAFF, Kampong Thom; KII Wessel, GIZ). Also, collaboration with local, regional, and national authorities as well as NGOs and (international) development agencies was perceived as beneficial to obtaining better access to infrastructure such as roads, irrigation, electricity, funding, education, technical equipment, and services including trainings, (KII DAFF, Kratie; KII MLMUPC; KII AC representative, Kampong Thom; KII Chan, SoA; KII Wessel, GIZ). However, this process first and foremost requires the establishment of trust and time (KII Wessel, GIZ).

5 Discussion

5.1 Overview

We start our discussion with a contextualization of the role of agricultural income for rural households. As presented in Chapter 4.1.3, only a small proportion of land recipients rely on self-employment in agriculture as their primary income source. Just 15 of the 293 surveyed households (5 %) generate more than three-quarters of their total annual income from self-employment in agriculture, i.e., from selling crops, fruits, vegetables, or livestock products. While all households are involved in at least one of these activities, around half of them earn around 10 % or less of their annual income through agricultural activities.

Here, it needs to be stressed that monetary income only measures the marketed segment of agricultural production, but many agricultural activities, e.g., most of the paddy rice cultivation, are carried out for subsistence purposes. In fact, national data state that over 80 % of the Cambodian population is reliant on subsistence farming (National Institute of Statistics, 2018). Clearly, subsistence production still plays a central role for rural livelihoods in the target areas and its important function should not be overlooked when promoting cash crops. To "do no harm", cash crops should only be promoted as complementary to existing subsistence production and should not replace it.

Almost six in ten households (58 %) claimed to carry out paid labor in agriculture, making this the most common income-generating activity for land recipients in both provinces. This raises the question of why land recipients do not focus more on self-employment in agriculture, which, according to our results, is the preferred form of income generation for the majority. Possible reasons could be that the land available to them is too far away, is degraded and cannot be cultivated, or that the households lack the labor force or financial resources either to clear their lands or to obtain inputs and equipment to cultivate it. The latter is underpinned by a MAPP workshop participant's statement in Kampong Thom, *"It was difficult to earn enough money for the rental of a tractor."* The ACs' rental services can help overcoming this hurdle. Similarly, the shift from paid labor to self-employment on one's own land is often facilitated by the AC and generally perceived as positive as reflected in this land recipients' statement, "*[In the past, land recipients] needed to provide labor to others to sustain their living or chose migration as a strategy. Now they work on their own fields*" (Land recipient, MAPP Kampong Thom). Therefore, although the agricultural status quo is characterized

by a strong imbalance between self-employment and paid work, the trend favors self-employment in agriculture and should be closely monitored to assess the ACs' impact on their members' livelihoods.

Another reason why farmers do not engage more in self-employment in agriculture could be their negative perception of the markets and that their products are either insufficient or not marketable. The assumption is confirmed by a land recipient in the province of Kratie, who said, *"I wish to see development in our community such as markets and to have a legal structure and regulations… It's extremely challenging for us"* (KII land recipient, Kratie). The growing success of contract farming schemes may address this negative perception.

In this context, the effects of climate change on Cambodia pose a major threat to rain-fed agriculture (Yusuf & Francisco, 2009; see Chapter 1.2). Rising temperatures, a less predictable monsoon, and a corresponding increase in the frequency and severity of floods and droughts can be disastrous for already-vulnerable rural households. The reductions in crop yields and household income can plunge households into financial crises. Against this background, it seems understandable that land recipients do not focus their livelihood strategies too heavily on agriculture.

With a surveyed average of two to three different income sources per household, income diversification strategies including internal migration, may mitigate the risk of agricultural income loss. Therefore, we consider it essential that project and AC interventions take into account that land recipients build resilience in pursuing diversified livelihood strategies, also beyond agriculture.

Home gardens, which almost all land recipients in the ILF target communities have, may be part of this approach and should be strengthened. Although large yields and profits are not expected from these small home gardens, the production of fruit and vegetables can provide the land recipients with a more diversified and stable diet and a small additional income (see Chapter 4.2.8).

To ensure that agriculture becomes a safe and reliable source of income for land recipients, it is important that external support measures are not yet phased out. This is important because many of the land recipients are currently investing in agricultural products, particularly cashews, which will provide substantial long-term income and, thus, promote financial and food security, but are not yet producing marketable yields.

5.2 Impacts of ACs on Livelihoods and Food Security of Members

Membership in an AC clearly has substantial positive effects on members' income, as shown by our quantitative analysis using PSM. As was made clear in Chapter 4.2.6, both the agricultural and the total income of AC members exceeds that of non-members significantly. To illustrate which factors of AC membership contribute to these observed differences in income—a crucial factor in securing livelihoods and increasing food security—the most important ones will be discussed in the following.

5.2.1 Characteristics of Organic Cultivation

So far, certified organic production by approximately 800 members from the ILF target communities can be considered a success (KII Wessel, GIZ). Nevertheless, there still seems to be resistance and low appreciation among smallholder farmers for organic cultivation techniques. Although farmers are aware that higher prices can be achieved through organic products, conventional farming is still more attractive to many of them. Many perceive organic agriculture's cost–benefit ratio to be insufficient. As mentioned above, organic farming is labor intensive to the extent that labor-constrained households refrain from engaging in it.

A classic problem with collective action in organic production occurs when farmers experience the use of conventional farming methods as much simpler, cheaper, and more effective and therefore ignore the contract requirements for organic farming. Kamya describes the consequences of potential shirking of contracting firms' standards by individual farmers as follows, *"If, for example, one of the producers uses chemicals, then I do not get certified products and cannot deliver and keep my own contracts."* (KII Grötschel, Kamya). In addition to well-functioning internal and external monitoring systems, which both ACs claim to have, it is essential that farmers become aware of the economic benefits of the long-term sustainable cultivation techniques when investing time and resources in organic production.

In addition to the world market's growing demand for organic products and premiums of 20 to 25 % for organic products, organic techniques also preserve the soil and other natural resources. This in turn, improves the long-term prospects for Cambodia's agriculture.

5.2.2 Organic Contract Farming

Both ACs' contract farming arrangements follow an intermediary model: farmers sell their organic agricultural produce directly to the ACs, which in turn resell the produce in a specified quantity and quality at a set date to the contracting firms, thereby obtaining higher sales prices. The intermediary model is the most common contract farming model in Southeast Asia (Sari, 2011).

The SASAC in Kampong Thom has a contract farming agreement for organically grown cashews with Kamya Agritrade Co. Ltd. In addition, both ACs in Kratie and Kampong Thom hold contract farming agreements for organic cassava with CACC and for the cultivation of organically grown mung beans and sesame with SoA. However, according to informants from both ACs as well as from SoA, only small profits have been generated from mung beans so far. Due to the farmers' inexperience with this product and unfavorable soil conditions, harvests failed in the first year after signing the contract (Chan, SoA; Sok, GIZ). In contrast, contract farming of white and black sesame in two other ILF target provinces, Kampong Chhnang and Kampong Speu, has been more successful. At the time of the survey (October 2020), the first 1.8 metric tons of white sesame and 1 metric ton of black sesame from the latter two provinces had just been sold to SoA and another Cambodian agribusiness company (MSD Phat, GIZ). Also, peanut contract farming is already well established in these two provinces and is planned to be tested in Kratie and Kampong Thom as well. Contract farming for mung bean and sesame with SoA is not yet well enough established in the provinces of Kratie and Kampong Thom to enable solid analysis. Therefore, the cashew and cassava arrangements in Kampong Thom and Kratie will be examined in more detail.

5.2.3 Organic Cashew Farming

The cultivation of organic cashews plays a major role in ILF target communities. Almost half of the surveyed households (46 %; n = 136) were involved in the cashew cultivation, though only few trees were producing at the time of the survey. Among the sampled AC-member households, this figure was even higher (58 %, n = 79) with half of all AAC members and almost seven out of ten SASAC members being engaged in the cultivation of this crop. Of these 79 AC members, however, only 13 % (n = 10) stated they have sold their organic cashews under a contract farming agreement. This can be explained by the newness of the situation: farmers have only recently planted; thus, the trees are not yet producing the marketable yields that are normally anticipated after three years of growth at best. If we look at the 136 cashew farms current stage in the production cycle in both provinces, we see

that the proportion of farmers who already sell their products to Kamya corresponds exactly to the proportion of farmers who already harvest cashews (i.e., 13 %). The other 87 % (n = 118) are still in the investment stage, waiting for their first yield.

Cashew production requires large investments. According to the DAFF representative from Kampong Thom, *"Cashew plantations have the greatest potential for SLC farmers, but they cannot afford to purchase enough stock. The price is pretty high."* Of the farmers that are currently in the investment phase, about 32 % (n = 38) are able to cushion the investment costs with sales of other crops and can avoid net losses. Another 30 % (n = 36) are currently recording negative agricultural incomes due to their investment in cashews. Overall, 60 % of the total of the 61 farmers in the entire sample who suffered losses from agriculture, did so because of their investment costs in cashews.

The high investment costs and the lengthy juvenile period discourage households from cashew cultivation. But those farmers who have already entered cashew production are among the households with the highest agricultural incomes. Their average annual net income from agriculture is $2,200 U.S. dollars (± 3,000; n = 18), which is four times higher than the average value for AC-member households (see Chapter 4.2.6). Our results have proven that in this context, the production of a highly profitable perennial crop such as cashews in combination with other income-generating activities is a successful approach for long-term income generation. Simultaneously, this strategy cushions the risk of income losses due to failed annual crop harvests.

Global demand for cashew is on the rise; in the past 10 years, cashew consumption in India has more than doubled, Europe's consumption has grown by 30% ,and China's consumption is on the rise too (e.g. Dendena & Corsi, 2014; GIZ, 2019b). With only 1,000 mm of annual rain required, cashews are suitable for poor, dry land and can withstand drought (Wickens, 1995). The cashew tree is robust and can grow in a range of soil types, especially sandy soils that are generally unsuitable for other types of crops. Furthermore, climate change provides opportunity for cashew production to expand and replace other cash crops such as cocoa. However, it should be kept in mind that cashew trees will not grow in poorly drained soils and that during harvest, nuts can rot after periods of rain.

We therefore recommend continued support for cashew cultivation, at least until those farmers who invested in cashews enter production. Continuous support would attract more smallholder involvement in this investment-intensive but very promising sector. Direct monetary support, interest-free credit, and inputs such as

seedlings and organic fertilizer can be provided by GIZ and distributed via the ACs. Another approach could be a "breeding on credit system" in which contract farming partners could provide land recipients with inputs for cashew cultivation on credit, which could be repaid when they enter production. However, given the elevated interests rates in Cambodia, three years might be too long for investment on credit.

Processing raw cashew nuts into edible kernel is an additional promising approach to achieving the ACs' long-term financial independence. Through the vertical integration of further work steps in cashew processing (i.e., roasting, shelling, drying, peeling, grading, etc.), higher prices can be achieved for the final product. Moreover, prices for processed products are less exposed to price fluctuations than those for raw products. In addition, dried cashews can be stored for longer periods of time, which reduces the dependency on a quick sale and increases the cooperatives' bargaining power.

5.2.4 Organic Cassava Farming

As with cashews, organic cassava is currently sold directly to the intermediary ACs, which in turn sell it to the CACC. The CACC provides inputs for production on credit (KII AC Rep., Kratie). From the 97 sampled households that cultivate cassava, 58 % (n = 56) are members in an AC. Of these, only one in five households claims to cultivate this crop organically (n = 11) and only 11 % (n = 6) state they sell their organically produced cassava in a contract farming arrangement via one of the ACs. These testimonies stand in contrast to statements from the KIIs, in which much higher numbers of actively participating small farmers are mentioned. For example, a representative of the DAFF in Kratie stated:

> *"Last year, there were less members and now it reaches over 60 who became parts of organic cassava production … selling it directly to the AC. The AC, in turn, sells it to the company, who offers a higher price plus a premium."*

The contradicting findings suggest that the smallholder farmers who sell their cassava to the ACs are not fully aware that these, in turn, sell the cassava to contracting firms. If this assumption is correct, this would indicate that there is a lack of target-group-oriented communication from the ACs about the business model. Since smallholder farmers repeatedly expressed concern over the lack of markets as a reason for avoiding self-employment in agriculture, awareness raising and transparency on contract farming arrangements could lead to higher motivation to grow organic cassava within ILF target households.

If one looks primarily at commercial agriculture in Kratie, it becomes clear that around 30 % of Kratie households' agricultural income comes from cassava. If we

also look at the yields and profits of cassava farmers in Kratie, it becomes evident that only 7 % of them have suffered financial losses in agriculture. An interviewed land recipient in Kampong Thom said, *"The positive one is just only cassava production. This makes other communities want to join."* 85 % of surveyed cassava farmers generate profits in their agricultural endeavors, which may also include investment in cashews. Cassava cultivation thus seems to be a model of success. More transparent communication from the ACs to smallholders should further strengthen the ACs' role in the community.

5.2.5 Credit and Indebtedness

Since 2014, a clear trend of increasing indebtedness in ILF target communities has emerged (Chapter 4.1.4; GIZ, 2020). Even though the percentage of indebted households is relatively stable at around 70 %, the average amount of debt per household has increased (Table 3); in 2014/2015, the average household debt was around $374 in U.S. dollars, whereas our data from the second half of 2020 showed that the amount has more than quadrupled to $2,060 in U.S. dollars. The greatest proportion of the indebted households spent this money on long-term investments (e.g., for establishment of small businesses; 35 %) and agricultural inputs (34 %). These kinds of productive investments generally lead to increased income and benefit development (IFC, 2014).

Most of the debts (around 70 %; Table 3) are held with MFIs. MFIs in Cambodia tend to apply high interest rates and households with long-term investments may end up paying large amounts of interest (Green & Estes, 2019). Furthermore, some of the indebted households have taken loans to meet household consumption costs (23 %) and healthcare costs (19 %). A small but increasing share of households have already taken loans to repay older debts (from 2–3 % of the loan holders in 2016 to 5 % in 2020). These households are particularly vulnerable to over-indebtedness and debt spiral (IFC, 2014). A total of 15 households stated they lost part of their land to repay debts, which shows that over-indebtedness is, indeed, a risk for ILF target households.

Our data have shown that AC members hold significantly more debt than non-members (Table 10). The relationship between cooperative membership and indebtedness is complex (Mateos-Ronco & Guzmán-Asunción, 2018) and to be able to establish the underlying factors, further research is required. Based on our research we can only hypothesize, that the indebtedness of AC members may be a direct effect of their membership. As members have more stable and higher incomes from agriculture, they may tend to take greater investment risks.

Furthermore, members may feel more secure as they are part of a larger social network, which may even offer loans, as was the case in this study. Alternatively, members may have to take greater financial risks as they are obliged to deliver a certain quantity of produce through contract farming schemes.

Studies on indebtedness in cooperatives usually focus on the debt of the entire cooperative rather than on individual members (e.g., Jeromi, 2007; Path, 2008), but two studies from Thailand (Sanguanwongse et al., 2019) and China (Luangsangthong & Zhang, 2013) describe the trend of larger debts of individual cooperative members. According to these studies, the main reason for members to obtain credit was meeting short-term needs (e.g., due to insufficient income) rather than long-term investments and do, therefore, not necessarily describe the same main underlaying reasons as in our context.

Furthermore, it should be noted that we questioned a disproportionally high number of cooperative members (half of the surveyed sample set was cooperative members, whereas in society, cooperative members make up a smaller part of the total target community). As described before, members tend to have higher debts, and thus the average amount of total debt in this study is probably overestimated.

Nevertheless, a close monitoring of the indebtedness of the target households should accompany the supportive measures offered to land recipients. When larger parts of the population are forced into debt spirals, appropriate countermeasures should be considered by development agencies. Otherwise, the farmers as well as the development projects may lose their achievements to the ever-growing Cambodian MFI sector, leaving behind landless poor.

5.2.6 Food Availability, Stability, and Access

The surveyed AC-member households of the ILF project are more food secure than non-member households. This trend is visible in all three grades of severity of food insecurity on the FIES scale (Table 13). This may be due to several reasons. First, a larger proportion of member households generates agricultural income (Table 6) than non-member households. This means they are more capable of accessing food in general. Furthermore, members generate higher incomes from non-agricultural sources, which means they can spend more money on their household consumption. In general, AC members are better able to cover their household consumption needs and thus experience lower food insecurity.

We were not able to determine the effect of home gardens on food security for land recipients since almost all of them had home gardens and there was no significant difference between members and non-members in this regard (Chapter

4.2.8). Several studies show that smallholder farmers maintaining home gardens are more food secure than those who do not (Galhena et al., 2013; Musotsi, 2018). Should the support of home gardens through the ILF projects continue, we recommend conducting a survey with a sample containing households with and without home gardens. Several studies indicated that the commercialization of home garden products can have negative effects on food security when households sell their garden produce rather than consuming it (e.g., Abdoellah et al., 2020). This was, however, beyond the scope of this study.

Compared to previous food security surveys, our data suggest that moderate food insecurity has increased significantly since the beginning of 2020. Our calculations show that 12–19 % of the households were moderately food insecure and 1–2 % were severely food insecure at the time of the survey. In contrast, the 2020 GIZ food security survey shows that less than 1 % of households experienced either moderate or severe food insecurity (GIZ, 2020). This surprisingly large difference likely roots in the ways the method was applied. The FIES questionnaire requires the interviewer to have a thorough understanding of the methodology and the relevance of the very specific questions. We did not put enough emphasis on this issue when instructing the team of enumerators. For more details on this issue, please refer to chapter 5.6 on limitations.

AC-member households experience slightly more dietary diversity (Figure 13) than non-members. Although, the results are only marginally significant, cooperative member households seem to consume more meat and sweets, which are both considered as foods for the better-off households. On average households consumed 7.9 types of food per day (Figure 12). A dietary mix of 8 food groups fulfills the minimum requirements for a healthy diet (e.g., GIZ, 2020). 54 % of all households (n=159) are above this threshold. The household's foremost food groups ranked by importance are: Cereals, vegetables, spices, fish, oil, meet, sweets, fruits, and eggs. The observed average consumption of eight food groups per household is an increase by one food group, compared to the previous year (GIZ, 2020). This increase may be attributed to a general increase in living standards or it might simply result from the different time periods in which the surveys were conducted: our survey was conducted in the rainy season when home gardens were lush and more crops might have grown, leading to a more diverse food availability. Around 85 % of the respondents claimed that they ate more types of food since they started a home garden. This finding also complies with statements from interviews (Grötschel; Wessel; Bartels; Land recipients) which reinforced that ownership of home gardens goes along with diets that are more diverse.

5.3 Social Inclusion

The disaggregation of members and non-members according to income quintiles has shown that more AC members belong to the fourth (23 %) and fifth quintile (26 %), whilst only 34 % have below-average income. Above-average income applies to 50 % of AC members and only to 31 % of non-members (Figure 15). This indicates that AC members are better off within the SLC communities in general.

This coincides with the insights from Bizikova et al. (2020) who identified major types of socio-economic factors influencing the membership structure of farmer organizations. Members of FOs are more likely to have completed primary education or higher, to have larger land tenures than other community members, and to own goods such as radios. Non-members are the poorest landholders with the smallest plots and have a longer distance to markets, less access to year-round roads, lower levels of education, and limited financial resources (Bizikova et al., 2020,). According to Minah and Malvido Pérez Carletti (2019) poorer households participate less in FOs. Bizikova et al. (2020) also found that households on the margin *"incur higher transaction costs"* (p. 626) accessing FOs. The study recommends supporting poor farmers, while checking barriers and incentives to access FOs.

The World Bank's definition of social inclusion, *"the removal of institutional barriers and the enhancement of incentives to increase the access of diverse individuals and groups to development opportunities"* (World Bank, 2013, p. 256) should be considered by ACs aiming at becoming inclusive. The integration of new members increases diversity.

In our study area, the initial investments for permanent crops like cashew as well as the long-term returns are high. Subsidizing these investments for poor members could reduce barriers to production of high-return perennial crops. Therefore, membership should be available to all households who wish to join but lack financial resources to participate in ACs.

5.3.1 AC Management Structure

A transparent AC structure leads to a higher degree of trust and sense of belonging, which results in growing member numbers. Open communication and transparency between all parties is indispensable for group cohesion. Allen and Allen (1986) state:

"In the process of developing a sense of community, a shared vision, and a positive culture, the organization will not only be in a better position to accomplish its immediate program goals but will also be in a vastly improved position to undertake new change efforts." (p. 47)

Common goals and good relationships between the AC members should be actively developed in regular meetings, with easy and clear communication, thus creating a positive culture and strengthening the community. Eventually, this leads to the desired sense of community highlighted by Allen and Allen (1986).

Most of the AC members said that the decisions taken by the ACs correspond to their personal needs which might indicate that the processes of alignment and voting work. However, KIIs suggested that fewer members participate in meetings and training over time, leaving the management struggling with low member engagement. According to Mansuri and Rao (2013) *"Communities tend to express greater satisfaction with decisions in which they participate, even when participation does not change the outcome or when outcomes are not consistent with their expressed preferences"* (p. 10).

Even though AC meetings offer space for complaints and concerns, some members were hesitant to raise issues out of respect for the volunteer staff leadership's time and authority. AC representatives should strongly encourage members to voice their concerns. AC leadership should also be encouraged to use simple language when addressing members. This may lead to higher efficiency. As Fung and Wright (2001) argue, efficiency can be reached by considering diverse opinions, by shortening feedback loops and bureaucratic procedures, and by participation at an early stage.

When we contextualize these findings on participation within the Participation Pyramid (Straßburger & Rieger, 2014, see Chapter 2.4), the levels of participation within the AC are remarkably high. In our view, the main obstacle to reaching the highest level (where AC members organize and manage their organization and implement projects independently from external assistance) is the lack of a capable and professional leadership. In absence of funding mechanisms to support a robust management team, they remain dependent on external donors or development agents. A management that develops out of the community would be desirable.

This suggests a strategy which combines competitiveness with pro-poor growth. Strategies for competitiveness should allow members with higher assets to participate in contract farming arrangements and specialize in cash crop production for external markets, thus generating more income. Pro-poor strategies

should focus on saving groups, rice banks, and subsidized inputs and should primarily target low-income and food-insecure members. With adequate support, the ACs can help these members develop their livelihoods. A GIZ field officer phrased this as, *"The mindset of survivor moved to the mindset of business level."* (KII Phat, GIZ).

5.3.2 Access to Services

AC representatives claimed that they put in a lot of effort to give every member the chance to participate, regardless of disabilities, age, income, and gender. Even non-members can participate in trainings, machine rentals, and organic farming training. Nevertheless, access to AC services requires payment of a membership fee and 13 % of all members who left an AC left because of this fee. The rationale behind and the correct use of the fee needs to be communicated when advertising AC membership.

Besides the monetary entrance barrier, unequal financial benefits for members were identified in the KIIs. This brings inequality and creates conflicts of interest.

5.3.3 Gender and Women's Participation

The surveyed households were predominantly male headed (members 75 %, non-members 67 %), but the AC lists high proportions of female members (47 % in SASAC and 80 % in AAC). According to Bartels (GIZ), the high proportion of female members is a result of gender roles in many households: men migrate for work while woman tend to agricultural work, including maintaining relationships with ACs. *"For example, they are present in more meetings and coordinate the work with the ACs"* (KII Bartels, GIZ).

Do ACs empower women by offering them trainings and a platform for their voice and influence? We did not conduct research into the women's reasons for participating in ACs, however, a study on ACs and social empowerment of women in Uganda by Ferguson and Kepe (2011) shows that women, through participation in ACs, gained confidence, negotiation skills, the ability to be of service to their communities through transferring skills to non-members, and the ability to take control of certain household decisions (Ferguson and Kepe, 2011). Participation in cooperatives might empower women, but it might also increase women's overall time burden (Lyon et al., 2017). Gender equality requires more than women being a member of ACs; it requires additional support structures to increase women's access and control over resources and reduce their time burden.

5.4 Exchange of Local Knowledge

As indicated in Chapter 2.5, we define local knowledge as knowledge that people in a given community developed over time and adopted continuously to a changing local culture and environment. Being part of the human capital, local knowledge *"is the main asset [local people] invest in the struggle for survival, to produce food, provide for shelter or achieve control of their own lives"* (FAO, 2004, p. 9).

As we have seen in Chapter 2.5, local knowledge can increase ownership in development strategies. Those strategies should recognize that intervening and introducing new knowledge to a community always holds the risk of competing with traditional knowledge.

> *"Development agents… need to recognize, value and appreciate local knowledge in their interaction with the local communities. They need to understand exactly what it is before it is incorporated in their approaches. They also need to critically validate it against the usefulness of their intended objectives."* (FAO, 2004, p. 11)

The challenge is to carefully complement existing local knowledge with newly introduced concepts. Supporting agencies, among them the ACs, contract farming partners, as well as the GIZ, are the most important sources for innovative agricultural techniques. While development partners clearly have the resources to bring about positive change in people's lives, they may also create dependencies that are difficult to reverse over time without risking the achievements.

The target groups of this study were land recipients of the SLC program and, therefore, have not coexisted in a community for more than 10–15 years and may not have been farmers before receiving land allocations. Still, the KIIs show that a lot of traditional knowledge on cultivation practices exists; however, fostering knowledge exchange between older and younger generations or across communities to preserve and adapt that knowledge remains a challenge. The strategy to promote knowledge exchange should be locally devised. In our case, this responsibility should be anchored more clearly in the local ACs.

5.4.1 Exchange Platforms

Community members' immediate social environment remains one of the most important and easily accessible sources of farming information and experience, especially parents, grandparents, and neighbors. Open, knowledge-enriching discussions can symbiose existing and innovative knowledge and strengthen

livelihoods. ACs can contribute to that exchange as intermediaries as they can reach people of different ages, sexes, and education levels. They can preserve knowledge, introduce external ideas through their networks, foster discussions among community members, and make good practices available to a wide range of people. Existing practices like farmer-to-farmer extension and interest group gatherings should be expanded, possibly with the help from the ACs, who can organize or facilitate these groups.

The establishment of new platforms for the exchange of local knowledge serves inter- and intra-community as well as inter-generational exchange. Exchange visits to other communities, integration of regional organizations or companies in trainings, promotion of pilot projects, and promotion of local best-practice examples offer potential in disseminating information on successful farming techniques.

5.4.2 Digitalization

A keyword that came up a lot during our research is *digitalization*. Digital tools hold the potential to improve communication and efficiency regarding time and accessibility. Though the internet itself is not yet accessible to all, more and more people are gaining access to smartphones, especially AC members. Almost two thirds of the AC households have a smartphone and, hence, can access internet sources easily. As we only surveyed entire households, a question remains as to whether men and women have equal access to mobile phones.

Many interviewees found it attractive to receive their news, to handle arrangements, and to learn new agricultural techniques via their smartphone, especially using social media. These findings correspond to the national trend. More than half of all Cambodians have at least one smartphone, while 100 % of these access social media via their mobile phones, most commonly Facebook (Kemp, 2020). According to a 2016 study by the Asia Foundation and USAID, internet and Facebook were identified as the most important channels through which Cambodians access information (30 %; Phong et al., 2016). In 2020, 9.7 million Cambodians (58 % of the total population) were active social media users.

Digitalization plays an important role in the achievement of the 2030 Agenda for Sustainable Development: Paragraph 15 states

> *"The spread of information and communications technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies, as does scientific and technological innovation across areas as diverse as medicine and energy."*

Equal access to information and communication technology (ICT) allows women to access the same online resources and opportunities as men, which strengthens their voice on a local, national, and global level and provides *"new opportunities for women's economic empowerment by creating business and employment opportunities, particularly in the agricultural sector"* (GIZ, 2018, p. 4). We recommend analyzing and including women's access to ICT within the ILF portfolio.

In agriculture, ICT can impact many levels, from capacity building and empowerment to agricultural innovations and improved market access as displayed below.

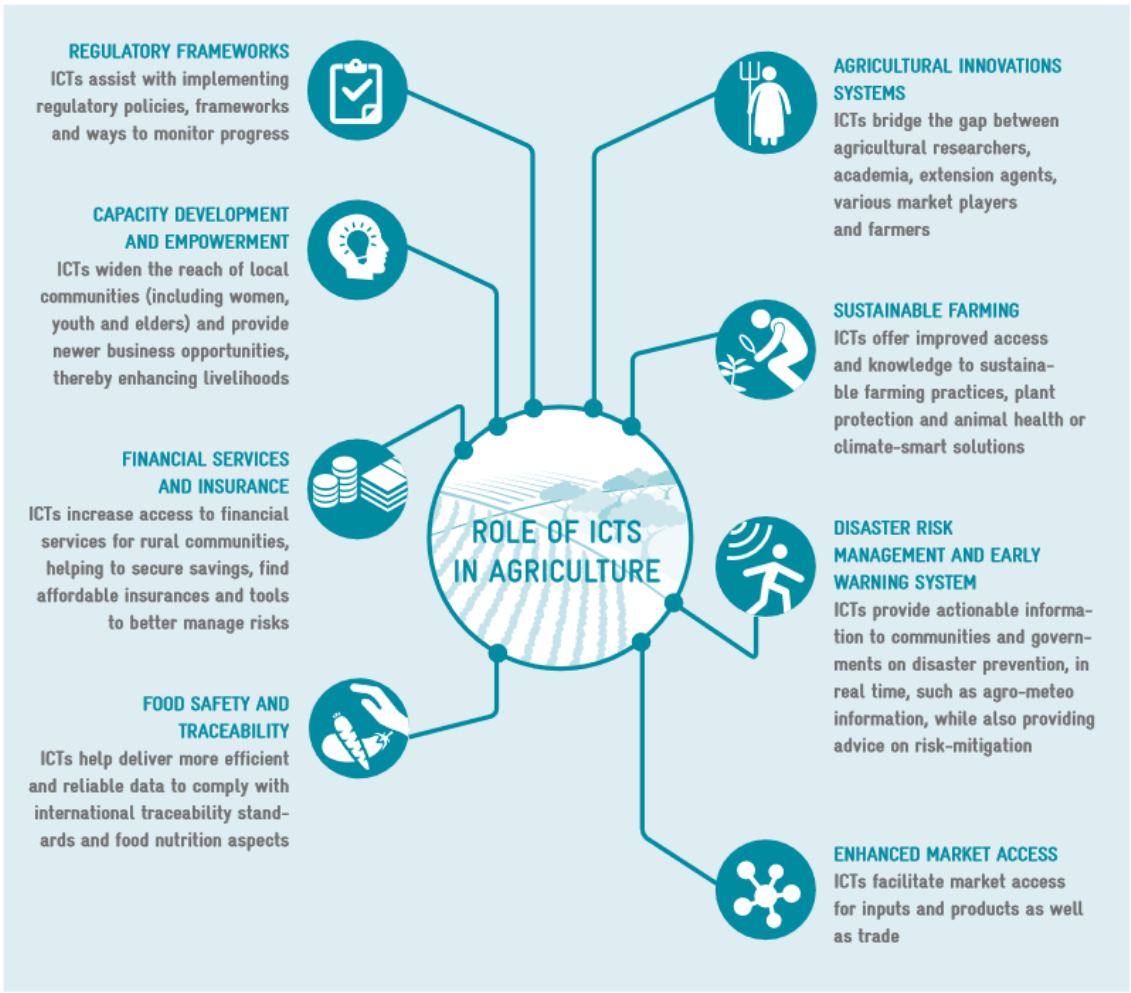

Figure 18: Role of ICT in Agriculture

Source: Gender and ICTs (FAO, 2018)

As the GIZ states in their publication on digitalization for rural development:

> *"ICTs are crucial for achieving all of the SDGs as they are catalysts that not only accelerate all three pillars of sustainable development (economic growth, social inclusion, and environmental sustainability), but also provide an innovative and effective means of implementation in today's interconnected world."* (GIZ, 2018, p.4)

Regarding the potential ICT has to offer, ACs should invest in digitalization to get closer to their members, facilitate access to information and training, and improve their own administrative processes. This requires that ACs have both the technical resources as well as the technical skills to administer social media groups or organize virtual meetings. Training for AC leaders are therefore indispensable.

Digitalization can offer both opportunities and threats to the preservation of local knowledge. It offers the chance to store knowledge and to make it accessible to future generations. At the same time, it holds the risk of excluding illiterate people and those who lack access to digital tools.

5.5 Autonomous and Sustainable Operation of ACs

In this section, we discuss the study results with regard to the desired autonomous operation of ACs. What factors contribute to a sustainable and autonomous operation, how can these factors be strengthened, and what role can the GIZ play in this context? In the following, we use the Theory of Change (Figure 3) as a basis to discuss factors of successful business operation, social inclusion, and exchange of local knowledge.

Formally registered private cooperatives are a new phenomenon in Cambodia. The widespread distrust in collective organizations is rooted in the historic experience of alternating statal systems of collectivization between 1975 and 1992. The establishment of the concept of private ACs as a viable way forward for smallholder farmers will take time. Therefore, efforts are needed on all levels to visualize potentials and benefits.

The distribution of SLCs is also marked by struggles for power and rearrangements of social order. Therefore, a long-term strategy for the ACs must not only consider the specific needs of individual users but must be embedded in and aligned with the national context of land management, changing trends in cultivation and markets, and the national agricultural policy.

In the long term, the ACs are to become independent of their donors and empowered to pursue their own objectives, strategies, and visions. As for now, the sustainable and autonomous operation of ACs is challenged by weak financing. We discussed strategies to harness the ACs' inherent potential, increase sustainability, and achieve autonomous operation in the long term. Our results suggest that successful business operation, social inclusion, and exchange of local knowledge must be taken into account simultaneously.

5.5.1 Successful Business Operation

Many AC members are at a critical point in cash-crop cultivation, particularly in cashew. At this time, phasing out ILF project support would be too early and would put project achievements at risk. ACs' lack of financial resources hinders investments and reduces their options for developing sustainable internal management structures. The ACs should be supported to develop a strategy for using the expected additional income from cashew cultivation for strengthening their financial capacity.

AC representatives and their business partners stated that the current voluntary AC management and administration by its own members needs to be strengthened. The employment of an (external) salaried professional is advised. This position does not necessarily need to be held by a farmer or land recipient, but recruitment should target persons with business and management know-how and may be guided by external assistance to avoid excessive influence from local power structures.

Within the AC structure, a clear division of tasks and responsibilities and effective internal control mechanisms with sanction mechanisms must be organized and agreed on by all members to guarantee equality, transparency, and trust. Development of a clear business plan with clear objectives based on comprehensive cost–benefit calculations should be a priority task for the new AC management structure.

The management also needs to scrutinize and prioritize the portfolio of services offered by the AC. The current range of services is high given the small number of members in both ACs. We suggest two strategies. On the one hand, it can be argued that the portfolio of services is too broad, indicating the services do not meet the specific needs of the members and prevents the effective management of services. On the other hand, a diverse portfolio of services attracts members, offers various services to address diverse needs, and encourages diversified livelihood strategies. Both options have inherent potentials and risks and should be

evaluated carefully before decision-making. In selecting a portfolio of services, ACs must prioritize services which most closely align with the target group's needs while still supporting the ACs' sustainable operation.

ACs' saving and credit services are attractive to members because of their low interest rates and lack of requirements for land titles as collateral. Still, insufficient capital prevents expanding this service. Rice banks may mitigate risks by pooling potentials and reducing seasonal food insecurity while the internal system of reciprocal support strengthens member cohesion. These services are perceived as favorable.

Provision of agricultural inputs and equipment does not currently meet members' needs and can be improved. Local partners should be given priority as input providers as they can best advise on local cultivation conditions. Moreover, the maintenance of the technical equipment needs to be improved.

Contract farming of organic products gives members access to external and international markets, reduces transaction costs, and mitigates the risks of price fluctuations. Nevertheless, potentials and risks must be carefully evaluated as production requirements are generally high. Global price developments require constant monitoring. Organic certification is a key requirement for market access and requires an effective control system. Organic farming requires a lot of labor force and specific knowledge. Consequently, organic contract farming best suits farmers who are skilled, have access to labor, and are willing to specialize and accept the investment risks of specialization. This invokes a lead farmer model where experienced farmers receive incentives for sharing their knowledge with interested farmers.

Proactive networking and alliance building with local private and public partners fosters vertical integration and bundles capacities. Thereby, the dependency from external donors is expected to decrease. The subscription of goods and services from local partners (e.g., the purchase of seeds or technical equipment) decreases dependency on donor agencies and fosters the integration of local economic networks. Frequent exchange with local, regional, and national authorities can better integrate the ACs' positions in governmental development programs.

5.5.2 Role of GIZ

The results of the study indicate that ACs are not yet ready to assume autonomy from the GIZ. Both the farmers and the ILF project staff are aware of the current challenges: "*Farmer organizations are still new. Without help, it will be difficult to assure sustainability.*" (KII Sotha, CFAP). "*I cannot say 100 percent that they (ACs)*

are independent, but for the organization it is ok. Now, I fear that the project ends, and they cannot afford it by themselves to go on." (KII Sok, GIZ)

Without further support, the ACs' potential described above is threatened. Here, we consider the kinds of interventions desirable for consolidating existing structures to achieve sustainable and autonomous operation of ACs. Firstly, ACs need to agree and act upon their own principles, objectives, and visions. This demands careful planning to devise context-sensitive interventions. AC ownership of all processes needs to be a core principle for external development agencies who should rather play a facilitating role while enhancing and valuing ACs' ownership and internal decision-making processes.

To fulfill this, first, interventions must only be implemented if they are in line with the beneficiaries' decisions and requests. This includes acting in line with the principle of subsidiarity. Second, building upon existing structures should be prioritized over building new parallel structures. Third, special attention must be paid to the beneficiaries' diversified livelihood strategies including subsistence production and non-agricultural income. Fourth, an exit strategy based on clear criteria for the desired independent and sustainable functioning of the ACs must be devised.

5.6 Limitations of the Study

5.6.1 Reflection on Methods

Household Survey

As the answers from the HSS were collected digitally, we rather opted for closed answers including multiple-choice questions. For a few questions, we felt the need for more detailed information and changed them to open questions. However, for the remaining categorized multiple-choice questions, the data analysis was occasionally challenging. For example, the question on number of years of farming experience, which almost all respondents answered with "more than 10 years", showed us that the land recipients were often experienced farmers. However, we could not use this information for the propensity score matching since we did not have a range of values. We recognize this as a limitation of this study and recommend that when deciding upon open or closed questions, the method of data analysis must be carefully considered.

The analysis of the data also revealed a few weaknesses in the questionnaire, which could have been corrected if we had been on site. For example, the

questionnaire did not ask respondents about the legal status of the land they were allocated. Although, according to the current SLC law, the land title of the SLC is to be transferred to the recipients after five years of continuous cultivation, we could not conclusively verify whether the titles were actually handed over to the recipients. This flaw was only discovered during data analysis. A closer look would also have been helpful regarding the role of subsistence farming. Moreover, for almost all households, their agricultural activities are only one of several distinct economic activities. Contrary to our original expectations, commercial agriculture plays only a subordinate role for the greatest proportion of the land recipients. Again, we only became aware of this when we analyzed the data after the survey, which did not allow us to adapt the questionnaire.

The FIES method that we used to calculate food security (FAO, 2017) was very challenging, particularly for the enumerators. It is important that interviewers have a clear understanding of the sequence of eight questions that they ask. Usually, the FIES questions are put at the end of the survey. This way, the interviewer can obtain an overview of the financial situation and is able to make a better estimation about the accuracy of respondents' answers to the FIES questions. Unfortunately, we did not put enough emphasis on this when training the enumerators. From the data, it became visible that respondents often misunderstood some questions. For example, some of the respondents who claimed to never have not had enough food to eat, still indicated they experienced hunger for a whole day. Therefore, the FIES results are partly unreliable and we decided to deemphasize the results and shift them to Annex 6: Supplementary Data.

Furthermore, recently the High Level Panel of Experts on Food Security and Nutrition (HLPE) emphasized the need to widen the understanding of food security and the right to food. In their most recent report, they advocated for adding two dimensions to the concept of food security and nutrition: agency and sustainability. Agency refers to the capacity to make one's own decision about what kind of food to eat, what to produce, and how to produce it. Sustainability, in the context of food security, means that food systems can guarantee a long-term supply without endangering economic, social, and ecological resources (HLPE, 2020). These recent conceptual innovations have not yet been applied in our study.

Participatory Rural Appraisal

When re-designing our methodology to accommodate a remote format, the PRA village workshops were the most problematic. In the interpretation of the PRA results, we had to realize that more in-depth contextual knowledge, which can only be acquired in country, would have been helpful. Moreover, the field manual had to

be shortened and simplified to meet the new schedule. Further limitations in that regard were already discussed in the previous chapter.

Still, some challenges arose independent of the research's remote nature. Language barriers and translation/interpretation errors would have occurred either way. Introducing academic concepts such as social inclusion and local knowledge without deeper explanation led to divergent interpretations of the tools by the participants and made comparison of results challenging. The implementation of the Venn diagram lacked the development of a realistic action plan. This might partly be because the importance of this step was not clear to the local research team. But it might also be that the method is a rather top-down approach, making it inappropriate for the establishment of local action.

Following this line of thought, it would have been more helpful to involve motivated and respected members of the target communities in the development of such research formats to better meet the interests and needs of the local community in the planning phase. Further, we realized too late that the PRA methods developed for the target communities in Kampong Thom and Kratie cannot be easily transferred to the study contexts in Kampong Speu and Kampong Chhnang. As farmers from these two provinces are not members of the ACs but beneficiaries of the organic certification program, many questions on the impact of AC services on their livelihood and food security were rather hypothetical. Still, by creating a constating picture of similar villages and by pointing out differences and potentials, interesting findings about organic farming, local knowledge, and the need for certain services could be obtained.

The division of the PRA workshop participants into groups of AC members and non-members has sometimes led to uncertainty among participants. Since non-members were grouped into a category that they would not have assigned to themselves, they sometimes found it difficult to share information.

The criterion of diversity in the composition of the participants was not always met. One workshop, for instance, was mostly composed of elderly participants who were no longer active in farming. It has to be assumed that this highly influenced answers regarding the impact of AC services on their livelihoods. Another workshop consisted mostly of women with small children, as their male partners were working in the fields.

Key Informant Interviews

Almost half of all interviews were conducted by the study team using online communication tools like Zoom or Skype. Still, interpersonal connection was

reduced because of instable internet connection and, at times, the lack of video. These factors hampered the creation of a trusting environment for the interviewees, which is of particular importance when talking about sensitive topics like exclusion or criticism of other institutions. Instable internet connections and language barriers sometimes led to truncated interviews. The introduction of highly theoretical concepts such as social inclusion and local knowledge led to confusion and generated different understandings of the terms.

We also identified the rather small number of interviews with farmers as a limitation of the study. During analysis, it became clear that land recipients often had the deepest insights and sometimes highly divergent perspectives. It would have been helpful to conduct more interviews directly with farmers.

The analysis of the KIIs was done in only two cycles due to time constraints. As for qualitative text analysis, the more loops the better. Thus, another cycle of analysis would have led to a clearer division and easier allocation of coded segments. It was not possible to compare and contrast the data consistently. An in-depth discussion on the differences and similarities across all methods at an earlier point would have benefited the process of merging qualitative with quantitative data.

5.6.2 Reflection on Remote Research

At the end of the field phase, the study teams in Berlin and in Cambodia decided to reflect on their experiences with the remote research and the lessons learned. We decided to apply the SWOT methodology again, which had already proven to be easy to apply and to generate results. Interestingly, the discussions focused almost exclusively on strengths and weaknesses.

Strengths

All team members agreed that they experienced good interactions within and between the teams. This was explained by the team spirit, mutual trust, and dedication to the study by everyone involved. Everyone's flexibility in participating in virtual meetings on short notice contributed to an efficient working environment. Surprisingly, internet connectivity was not perceived as a major issue.

A major asset for the successful remote management of this study was our experienced national coordinator, who was the primary contact person for the local staff. The local PRA team emphasized that receiving training from an experienced PRA trainer and GIZ's excellent preparation of the field work were key success

factors. The local team appreciated that the methodology was open to discussion and adaptation.

Summarizing, this experience taught us that together with the right team, strong dedication, and flexibility, a remote study is feasible. Remote research not only saves time and costs, but gives the national staff a more prominent role in the research process. We expect that such forms of remote data collection, remote research, and remote management will increase and arguably change the way of working in international cooperation, even when COVID-19 is history.

Weaknesses

During the design phase of the study, it was assumed that the Berlin team may travel to Cambodia and conduct the study in country. Therefore, the Cambodia team was recruited and instructed only at a late stage when many initial discussions were already held. Both teams agreed that it would have been beneficial to develop the study together from the very beginning. But, due to the short-term adjustments because of the COVID-19 pandemic, this was not possible. For future remote studies, we recommend including the local study team from the beginning and certainly during the design phase. On the one hand, this helps to ensure that local perspectives are considered in design and planning; on the other, it helps the local team to develop a shared understanding of the manifold decisions made during this phase.

At times, the local staff felt it was difficult to meet time schedules, fulfill contract agreements, and set terms and regulations. The PRA team experienced difficulties as the timeline prepared by the Berlin team did not always meet the realities experienced in the field. The short timeframe between the field testing and the implementation made it difficult to adopt lessons learned. Timeslots in between the workshops left little room for de-briefings, adaptations, and preparations, let alone recreation for the local staff members. Some of the methodical steps had to be simplified because of lack of time; sometimes it led to a loss of significance of the results. This also led to a situation where some important results lack information about context and causal relationships.

A similar observation was made by our translator. Communications on proposed interviews were often delivered to the communities late or incomplete. The interviewer reported that it would have been helpful to have an assistant to help with the note keeping. PRA village workshops and interviews should be accompanied by a professional translator who can guarantee accurate

documentation and proper translation and interpretation of the discussions, so the facilitation team can concentrate on the flow of the workshop.

The lack of digital infrastructure in the countryside made it difficult for us to participate remotely in the workshops and interviews. However, we appreciated the manifold pictures, videos, and reports which we received afterward and gave us an overall impression of the local situation.

A specific and important shortcoming for the Berlin team was the lack of contextual knowledge on daily life in rural Cambodia, its history and culture, and its linkages to our study. Literature alone cannot replace personal impressions and informal conversations on site. Against this background, triangulation of results and constant feedback loops with the Cambodia team were indispensable.

Surprisingly, the COVID-19 pandemic, besides restricting the Berlin team from traveling, did not have a great impact on the research in the field. The local research team and the participants upheld safety measures and, to our knowledge, that did not hinder people's participation in the interviews and workshops. Also, other meetings and travel plans were not affected by the current pandemic. The only workshop that had to be canceled was the final presentation of our study results to the target communities as the first Cambodian COVID-19 community transmission triggered a tight lockdown. Still, this had no impact on data collection itself.

6 Conclusion

When looking at the impact of agricultural cooperatives on their members' food security and livelihoods, it must first be made clear that in our study context the income from self-employment in agriculture is only a minor part of the total household income in most cases. Instead, livelihoods are rather diversified, with an average of two to three different sources of different types of income per household. Nevertheless, households derive most of their annual income from paid work in agriculture, which means that income is nonetheless mainly generated in the agricultural sector. The ACs in Kratie and Kampong Thom had a significant effect on the agricultural and total income of their members. On average, the 137 AC-member households earned about $300 U.S. dollars from self-employment in agriculture annually and, thus, twice as much as their neighbors who were not organized in one of the cooperatives. The higher agricultural incomes among AC members in the target communities are primarily the result of the contract farming of organic cassava and cashew, which is managed by the ACs.

Nevertheless, income generated outside of self-employment in agriculture still constitutes the largest part of annual income among ILF target households. Also, the total annual income is higher among AC members than among non-members. Looking at the various dimensions of livelihoods of both groups, it is clear that AC members, on average, show higher levels than non-members in many of these dimensions, which is primarily due to the bundling of efforts within the ACs. Members also have more human, physical, and financial capital than non-members.

Currently, only a little more than one in ten cashew farmers is already selling cashews under contract. Nevertheless, the cultivation of this perennial crop is a promising approach to securing long-term income on the one hand and spreading risks of income losses due to harvest failure of other crops on the other. It is therefore important that the land recipients, the majority of whom are currently still in the three- to five-year initial investment phase for this crop and therefore at a critical time in the production cycle, continue to receive support—not only from the ACs but also from the GIZ and the contracting firm, Kamya. Furthermore, the vertical integration of additional steps in cashew processing into edible cashew kernel by the ACs themselves seems to be a promising approach to achieve more long-term financial independence.

It is to be expected that cashew production will generate significant income in the near future. These additional revenues may form the basis of financing paid key

positions within the ACs. Currently the ACs' management is performed on a voluntary basis, which is perceived as a major obstacle for the further development of the ACs by most sources. In addition, those responsible often lack the necessary business capacity to ensure that the cooperatives can continue to successfully operate in the long term. Capacity development or the hiring of suitable, well-trained people who can take on leadership roles within the cooperatives would help them to run independently and make informed decisions even when the advice and support of the GIZ are phased out.

Organic cultivation should stay on the agenda and be further promoted. Although 800 households in the provinces of Kratie, Kampong Thom, Kampong Chhnang, and Kampong Speu are already involved in organic farming, it became apparent during the village workshops and KIIs that there is still widespread refusal of organic farming techniques among the land recipients. Conventional cultivation methods are perceived as less labor intensive, more cost saving, and more profitable than sustainable alternatives. To convince small farmers of the benefits of organic farming in the long term, it is not enough to point out the ecological advantages. Rather, the land recipients must experience the tangible positive effects of organic farming. Therefore, a detailed cost–benefit analysis of organic farming in the target provinces must be conducted, the results of which must be discussed with land recipients in a transparent and understandable manner.

Regarding Outcome 2 and social inclusion, it is important to integrate vulnerable households into both ACs and to increase their motivation to participate in them by communicating benefits of membership and offering tailored services and participation opportunities. More transparency regarding the rationale and usage of membership fees is necessary to enhance the understanding for this financial burden and to advertise AC membership among disadvantaged households.

Regarding Outcome 3 and the role of local knowledge within the ILF target communities, it can be summarized that the two most important sources of agricultural knowledge are development agencies (including NGOs and governmental organizations such as GIZ) and the ACs. The fact that "external" knowledge is so highly valued may be because the ILF target households are SLC recipients and, therefore, do not share a long, common history. Still, the KIIs indicated that a lot of traditional knowledge on cultivation practices exists and that the challenge mainly rests in fostering an appropriate knowledge exchange not only between older and younger generations but also between communities. ACs can contribute to such an exchange as intermediaries. With their resources, they

can introduce innovative ideas, foster discussions among community members, and make good practices available to a wide range of farmers. Among AC members, almost two thirds of the households already own a smartphone and their affinity to social media is high. Social media could be a target-group-oriented and suitable means of knowledge dissemination for the ACs. Therefore, both digital literacy within the ACs and literacy in general is still to be achieved.

Based on the data and findings, the aim of this work was to formulate informed recommendations for action for the users of this study. Based on the guiding principle of "help for self-help", the following recommendations are given to suggest a viable way forward.

6.1 Recommendations

The following recommendations intend to foster collective action by pooling local potentials within ACs. The proposed recommendations aim at the autonomous and sustainable operation of ACs in the long term and are directed to the identified direct users of this study, namely GIZ's ILF project, MLMUPC, and MAFF.

- **Ensure continuous funding to ACs at this critical point.** This includes various interlinked strategies to incrementally increase the ACs' capability to become independent in terms of management and financing. First, GIZ should continue to offer support for a limited period to ensure that the current investments can reach maturity. Simultaneously, additional income sources as e.g., the upcoming cashew production or rental services must contribute to the financing of ACs. Further, a clear business plan based on sectoral cost–benefit analyses will ensure the independent financing in the long term.
- **Develop an exit strategy** with clear rules and regulations to facilitate autonomous and sustainable operation in the long term. This includes ensuring that services, trainings, funding, etc. are either provided autonomously by the ACs themselves or by partnering actors from the public and private sector.
- **Combine different strategies simultaneously** addressing both cash crop and subsistence production by customizing services for diversified livelihood strategies. This includes strategies for mitigating risks and seasonal vulnerabilities in food security as well as strategies for increased long-term profit and competitiveness as done with contract farming of organic products.
- **Promote credit and loan services offered by** local credit and saving groups and create reciprocal intercommunity exchange systems to facilitate agricultural investments. Additionally, the management of rice and cattle banks helps to mitigate individual risks and strengthen resilience against seasonal fluctuations and climate change.
- **Enhance the potentials of contract farming** by providing transparent information on market developments, agricultural trends, certification processes, and legal frameworks and expediting contacts with possible business partners from the private sector.

- **Promote capacities for processing products along the value chain** by offering on-site value-adding infrastructure and services to increase and stabilize incomes along the value chain and to ease vulnerability to market fluctuations, seasonality, and export regulations. Further processing of raw products, creation of storage facilities, and the establishment of transportation systems are possible strategies.
- **Continue supporting home gardens** to further diversify diets, thereby increasing food and nutrition security and diversifying income sources.
- **Identify good practice examples and introduce pilot projects** by incentivizing successful farmers for sharing successful techniques and directing attention to promising potentials. Farmer-to-farmer extension is an adequate illustrative, hands-on way of sharing knowledge.
- **Offer consultation** on market dynamics, policy developments, value chains, and agricultural trends and support cost–benefit analyses to buttress informed decision-making.
- **Provide customized trainings and coaching** for the development of business plans and to strengthen networking with (local) partners from the public and private sectors.
- **Strengthen social inclusion** within the ACs by promoting formal and informal arrangements fostering trust, democracy, and transparency to build social cohesion and ownership.
- **Increase members' participation** in decision-making processes for example, early, language- and time-independent meeting notifications and easing conditions for membership like cost and time expenditure. Improved communication has the potential to for strengthening the member base.
- **Suggest viable formats for platforms for the exchange of local knowledge** by integrating digital innovations and traditional knowledge in strategies to promote intercommunity and intergenerational exchange and strengthen social cohesion.
- **Promote strategies of natural resource management and WASH** to counteract degradation and to foster health and sanitary infrastructure, while integrating these activities into regional planning and policy. Investments in land planning and soil fertilization, as well as water management and safe water storage are expected to have substantial benefits for the overall development of the commune and the region.

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Annex

Annex 1: Terms of Reference

Proposal for a study to be conducted by the SLE´s advanced study programme „International Cooperation for Sustainable Development"

„Improvement of Livelihood and Food Security of Landless and Land-Poor Households in Cambodia"

Seminar for Rural Development (SLE) at the Humboldt Universität Berlin

1. Land Reform and Food Security

As established under Sub-Decree 19 on "social land concessions" (SLCs) from March 19th, 2003 the Cambodian government has allocated private state land to landless and land-poor rural households for residential or agricultural purposes. Beneficiaries of the SLC- programme have to comply with the programme's criteria for five years before being able to request a formal land-title. These criteria often include the continuous cultivation of the land. However, many beneficiaries have difficulties to comply with these criteria, as, for example, some of their allocated land is not suitable for cultivation. Furthermore, many beneficiaries belong to the poorest of the poor, and lack means to use their land productively. As a result, beneficiaries' livelihoods and food security remain precarious, and they risk losing their land.

2. Project Partners

The research targets communes in the Kratie and Kampong Thom Provinces of Cambodia. In the region Farmer Groups and Agriculture Cooperatives (AC) developed to facilitate and improve linkage to agricultural markets and to increase the farmers' income on newly acquired residential and agricultural land. For this study project SLE will partner with two agricultural cooperatives, Aukorkei Agricultural Cooperative in Dar (Kratie Province) and Sen Akphiwat Samaki Agricultural Cooperative in Tipou (Kampong Thom Province).

3. Mission and Knowledge Gap

Though the recent developments have certainly contributed to the improvement of the food security status of many rural land users of the region, 8 years after the first implementation efforts of the ACs, a number of issues have remained under-researched and some of the initial problem contexts have dramatically changed. For paving the way for future development important knowledge gaps need to be reduced.

The SLE´s study mission is a thorough analysis of the local main impacts and mechanisms of change. Another study concern is the analysis of the sustainability and resilience of improvements in the land users´ service access, food security, and nutrition status. In other words: what happens after the end of support measures, which the ACs still receive and how could they develop sustainably and more independently? What are necessary complementary measures to strengthen the desired outcomes?

Another study concern is the development of recommendations to capture, maintain and expand local knowledge of farmers e.g., with regards to crop diversification and local seeds.

4. Analyses and Research Themes

Keywords: Theoretical and conceptual frameworks: Property Rights/Institutional Theory, agricultural contracting, land markets and changes, alternative Land Reform Concepts, small farmer commercialization, poverty and empowerment concepts, business model canvas, value chain approach, livelihood approach.

A. RQs: Socio-Economy and Livelihood-Analysis: What is Better/Worse?

1. How do the different types of households benefit from their organization in an AC? What are the economic, social, and cultural impacts of AC activities in the local communities and regions (commercialization, service and demand)?
2. How systematically were existing local resources, food system characteristics/vulnerabilities and local land-use knowledge incorporated into the AC's strategies?
3. How did/do important land use patterns change with implementation?
4. How did standard indicators and actors´ self-perception of inclusiveness and rural poverty change?

B. RQs: Who is to decide what? Governance and Local Institutions

5. How did the implementation of AC activities influence local policy processes and decision-making?
6. Did opportunities/practices to speak out in public and to participate in local decision-making change (empowerment)?
7. Did the activities have an impact on how communities are linked to each other or other political levels (participatory governance)?
8. Are there particular changes in transportation, sanitation/health, extension, risk management, finance, education? How sustainable are these changes (public goods)?

C. RQs: Cooperation: Perspectives for Better Rural Networking and Producer Integration

9. How did the patterns of rural/community cooperation change? Are there new opportunities for working together stimulated?
10. How were/are farmers integrated in local /global value chains? What are promising business models for a fair integration of small farmers?
11. What was and what is the role of farmer membership in producer organizations and local ACs? Are farmers financially participating in their cooperative?
12. Are there new/other types of farmers groups that have emerged? Certification/Labelling/ Export Licensing/ Microfinance

5. Research-Team of SLE

The research project is part of the post-graduate training course of SLE in 2020 and will take place from June 2020 to December 2020. A study report will be published in February 2021.

The study team will consist of 5 post-graduate students, up to 3 students from Cambodia and one team leader. The team will have interdisciplinary competences and experiences (political science, climate and environmental science, agriculture). Excellent English language skills are a must. The decision on the composition of the team will be taken end of May 2020. The SLE will base its decision on the professional and personal capacities as well as priorities of participants. Final decision rests with the SLE.

For the study SLE will draw on the expertise of different resource persons, mainly professor/s and experts of Humboldt-Universität zu Berlin: Professor for Collective Action, experts for smallholder farmers, small farmers business models, participatory research, and climate change adaptation in Asia. Moreover, SLE trainers and coaches will support the study group. Cambodian experts do work at the SLE and partners from Cambodia will be included if required and may be invited to Berlin.

Milestones to be achieved

- The following milestones need to be achieved:
- Agreement with cooperating academic partner finalized;
- Organisational and logistical planning agreed;
- Inception report agreed;
- Empirical data collection, project review and evaluation workshops conducted in selected research areas
- Preliminary study report presenting the initial findings and recommendations drafted;
- Final study report.

Annex 2: Social Land Concessions

Social Land Concession

A "Social Land Concession" is a legal mechanism to transfer private state land for social purposes to the poor who lack land for residential and/or family farming purposes. (2001 Land Law & 2003 Sub-decree N° 19 on Social Land Concession)

Local Social Land Concession Programs

Citizens/ the representative of citizens/ a civil society organization

Initiates a social land concession plan

Commune Council

- Initiates a social land concession plan; or
- Reviews the social land concession plan initiated by the citizens and/or a civil society organization

District Working Group

Submits the social land concession plan

Provincial/Municipal Land Use and Allocation Committee

- Reviews and approves the plan
- Informs the National Social Land Concession Committee about this approval

National Social Land Concession Committee

Reviews and approves the plan

Reviews and adjusts the plan or cancels the approval of the Provincial/Municipal Committee

Within 60 Days

National Social Land Concession Programs

One or more relevant ministries or institutions

May initiate a National Social Land Concession Plan in certain specific situations provided by law. The concerned Provincial/Municipal Land Use and Allocation Committee, commune councils and area residents shall participate in its development.

National Social Land Concession Committee

May approve the plan as proposed or, in consultation with the concerned ministry or institution, adjust the plan.

An approved social land concession plan shall be available to the public in the relevant commune/Sangkat office, Provincial/Municipal Land Use and Allocation Committee office, and the National Social Land Concession Committee office, during working hours.

Criteria to apply for social land concession

Be a Cambodian national

Poor and/or landless people/ families

Families who have been displaced resulting from a public infrastructure development project

Families suffering due to natural disaster

Repatriated families, demobilized soldiers and families of soldiers who suffered disability or died in the line of duty

Workers in the plantation areas of major Economic Land Concessions (ELCs)

Criteria for giving preferential treatment in the selection of land recipients

Large family size, having six (6) or more members.

Time the family has lived in the social concession land area.

The head of family is a woman, a person with a disability, a veteran with a disability or a demobilized soldier.

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November 2019

Annex 3: List of Interviews

National partners: 10

No	Date	Province	Name	Organi-zation	Inter-viewer	Note taker	Means
1	29.09.2020	Phnom Penh	Günter Wessel	GIZ	Carolin	Chris	Skype
2	30.09.2020	Phnom Penh	Sotha Sok	CFAP	Darina	Joost	Zoom
3	02.10.2020	Phnom Penh	Phalit Phat	GIZ	Andrej	Chris	Skype
4	02.10.2020	Phnom Penh	Hanna Bartels	GIZ	Chris	Joost	Skype
5	02.10.2020	Phnom Penh	Lina Sok	GIZ	Joost	Carolin	Skype
6	06.10.2020	Phnom Penh	Peter Chan	SoA	Joost	Chris	Zoom
7	06.10.2020	Phnom Penh	Andreas Grötschel	Pepper hill	Andrej	Carolin	Zoom
8	08.10.2020	Phnom Penh	Anonymous	NGO	Darina	Andrej	Jitsi
9	09.10.2020	Phnom Penh	Anonymous	NGO	Andrej	Darina	Jitsi
10	12.10.2020	Phnom Penh	Chann Soriya	MLMUPC	Darina/ Sophy	Carolin	Zoom

Subnational partners: 10

N°	Date	Province	Name	Organization	Inter-viewer	Note taker	Means
1	07.10.2020	Kampong Thom	Siv Churn	DAFF	Sophy	Sophy	In person
2	06.10.2020	Kampong Thom	Un Sakun	AC representative	Sophy	Sophy	In person
3	06.10.2020	Kampong Thom	Chhay Yu	Commune chief	Sophy	Sophy	In person
4	06.10.2020	Kampong Thom	Sek Sin/ Sun Vanna	Land recipient	Sophy	Sophy	In person
5	09.10.2020	Kratie	Seng Heng	Commune chief	Sophy	Sophy	In person
6	09.10.2020	Kratie	Hoar Pov	Land recipient	Sophy	Sophy	In person
7	09.10.2020	Kratie	Veng Chhun	Land recipient	Sophy	Sophy	In person
8	09.10.2020	Kratie	Ey Kimheang	Land recipient	Sophy	Sophy	In person
9	09.10.2020	Kratie	Ven Savin	AC representative	Sophy	Sophy	In person
10	10.10.2020	Kratie	Nget Kunthear	DAFF	Sophy	Sophy	In person

Annex 4: KII Code System

- 1 History of ILF
- 2 Description ILF target communities
- 3 Challenges for ILF target communities
  - 3.1 Lack of farming experience
  - 3.2 Indebtedness
  - 3.3 Credit/loan system
  - 3.4 Distance to AC
  - 3.5 Possession of land titles
  - 3.6 Climatic factors
- 4 Benefits from SLCs
- 5 History of ACs
- 6 Perception of AC
- 7 AC structure
  - 7.1 Rules
  - 7.2 Subgroups
  - 7.3 Roles/Responsibilities
- 8 Ministry Involvement
- 9 Contract farming
- 10 Challenges for AC
  - 10.1 Competition
  - 10.2 Lack of motivation of leaders
  - 10.3 Insufficient financing
  - 10.4 Loss of members
- 11 AC benefits for members
  - 11.1 Improved food security
  - 11.2 Improved livelihood
  - 11.3 Spillover to non-members
  - 11.4 Networking
  - 11.5 Income generation
  - 11.6 Collective action
  - 11.7 AC services
    - 11.7.1 Saving
    - 11.7.2 Loans
    - 11.7.3 Extension
    - 11.7.4 Agricultural Inputs
    - 11.7.5 Training
    - 11.7.6 Organic certification
- 12 Home garden
- 13 Participation
  - 13.1 Motivation of participation
    - 13.1.1 Cost benefit
  - 13.2 Challenges concerning social inclusion
  - 13.3 Decision-making
  - 13.4 Demographic Structure within AC
    - 13.4.1 Lack of Accessibility to AC/ services
  - 13.5 Sense of belonging
  - 13.6 Communication/ Information dispersal within AC
  - 13.7 Measures to promote social inclusion
- 14 Knowledge
  - 14.1 Existing local knowledge
  - 14.2 Sources of local knowledge
  - 14.3 Digitalization
  - 14.4 Ways of sharing local knowledge
  - 14.5 AC contribution to local knowledge
- 15 Success factors to promote sustainability of AC operations
  - 15.1 Quality of produce
  - 15.2 Trust
  - 15.3 Connection to buyers
  - 15.4 Management capacities
  - 15.5 Support by external institutions
  - 15.6 Sufficient financing
  - 15.7 Paid work in AC
  - 15.8 Shared vision
- 16 Lessons learned
- 17 Wishes for the future
- 18 COVID-19

Annex 5: EcoSan Household Survey

A comparison of the surveyed household characteristics in Kratie and Kampong Thom shows a strong and significant positive correlation between the communities' health status and the percentage of the population using improved sanitation facilities. We hypothesized that the promotion of ecological sanitation (EcoSan) toilets would not only improve health but simultaneously provide organic fertilizer to the households. Therefore, we decided to augment the main study with a complementary study on the acceptability of improved sanitation and, in particular, EcoSan. As this was not part of our original study design, we are publishing the results here in the Annex.

Background

We had access to a previous EcoSan project. In 2010, 20 interested households in Poun Phnom Village, Bati District, Takeo Province were equipped with Urine Diverting Dry Toilets (UDDTs) by the Swiss Red Cross (SRC). The project was not evaluated because the implementing project left Takeo province soon after.

We decided to contact the families and to conduct a small HSS (n = 20) to assess the long-term potentials of EcoSan toilets to produce organic fertilizer.

Northern Takeo is a rural region largely characterized by cash crop cultivation for the urban markets of nearby Phnom Penh, mainly vegetables. As the cultivation of vegetables benefits from organic fertilizer application, the region provided good conditions for a pilot in EcoSan.

Methodology

The survey is a long-term evaluation of an EcoSan project implemented by SRC in 2010. We intended to measure the long-term acceptability of UDDT EcoSan Toilets in Takeo province. Ten years post project implementation, we assessed the long-term use of UDDTs in Poun Phnom village with the intention of developing recommendations on EcoSan for the ILF project. All 20 original households were visited and 19 were interviewed regarding their use of the UDDTs. Data were analyzed with descriptive statistics (SPSS 20).

Results

We found that of the 19 households which had been equipped with UDDTs in 2010, 19 still owned the toilet buildings, though, not necessarily UDDTs. All 19 households used their UDDT for several years after construction and 16 indicated they were highly satisfied with the quality of the organic fertilizer produced in the

UDDTs. However, not a single UDDT was still in use in 2020. 17 households had converted the UDDT into a pour-flush toilet with a septic tank and two households had reverted to open defection. The most frequently cited reason for replacing the UDDTs was the wish to have a modern and clean facility. Also, the need for wood ash in UDDTs posed a problem. One interviewee explained: *"It was not easy to have wood ash; gas stoves are more popular so there is no more ash to use. We are in a modern time now"*; a second interviewee pointed in a similar direction: *"I stopped using it and changed it to a flushing toilet because it's a modern day. People no longer use the wood ash toilet (UDDT) anymore … using water is easier."*

Despite high initial acceptance rates, the UDDTs were not favored by the rural population in the long-term. Over a period of 10 years, nearly all were converted into more convenient pour-flush toilets which are also considered more modern.

Discussion and Recommendation

Our data from a neighboring province in Cambodia suggest that the practice of open defecation has a strong and measurable impact on health status. We recommend including WASH activities in ILF's project portfolio. A feasible and straight-forward approach would be to first sensitize the population in Community-Led Total Sanitation (CLTS)[7] village workshops in partnership with the Departments of Rural Water Supply and of Rural Sanitation of the Ministry for Rural Development. Secondly, ceramic water filters can be offered (e.g., in cooperation with the Cambodian Red Cross) as well as toilets with substantial subsidies for the poorer strata of the target population.

At first glance, UDDTs seem to be a perfect solution to improve sanitation while simultaneously providing organic fertilizer. However, according to our assessment of long-term acceptability of UDDTs, this approach is not accepted in the long term. Most households prefer pour-flush toilets with septic tanks. For health reasons, these should be equipped with a double vault so that the two chambers can be used alternatingly.

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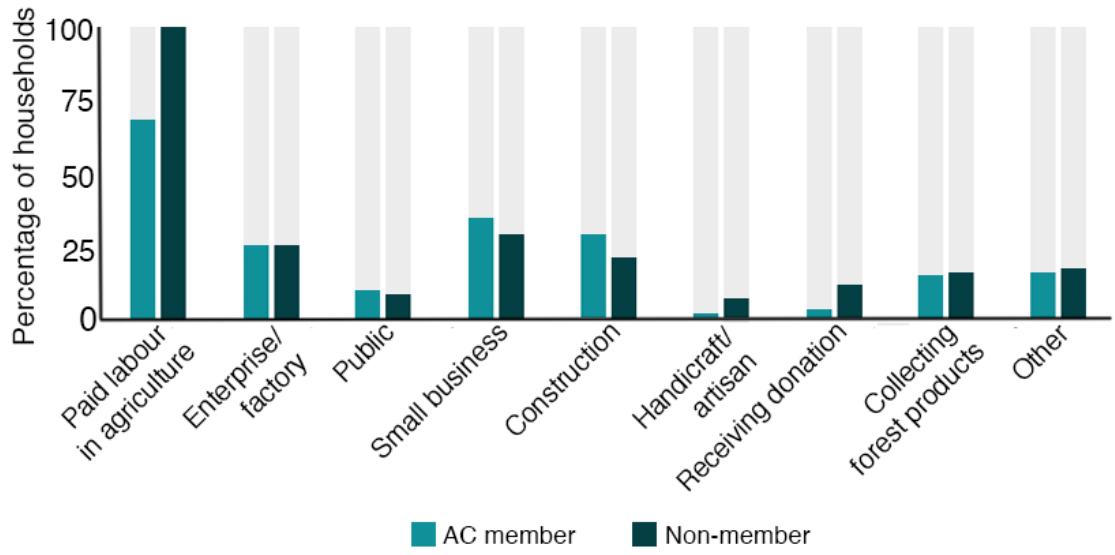
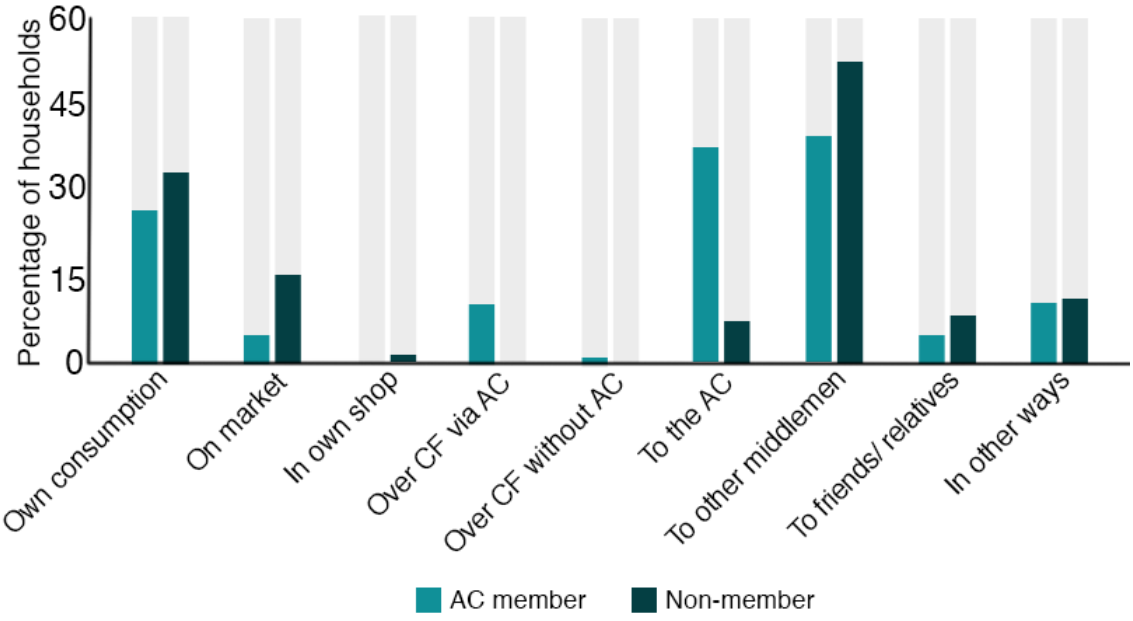
[7] Community-Led Total Sanitation (CLTS) is a proven and powerful approach which is widely used in Cambodia and can be combined with any intervention in the field of WASH to deliver good results (Kamal Kar, 2008).

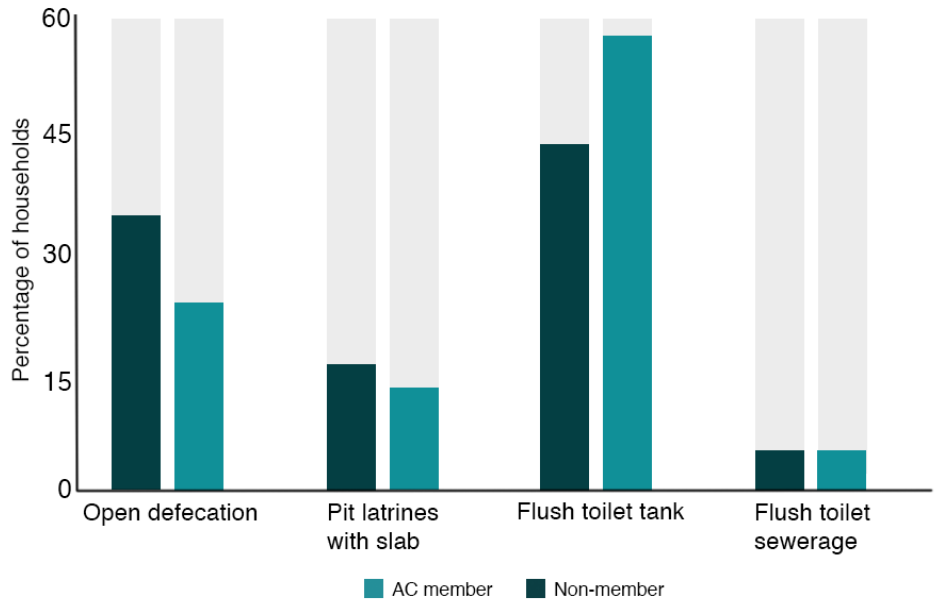
Annex 6: Supplementary Data



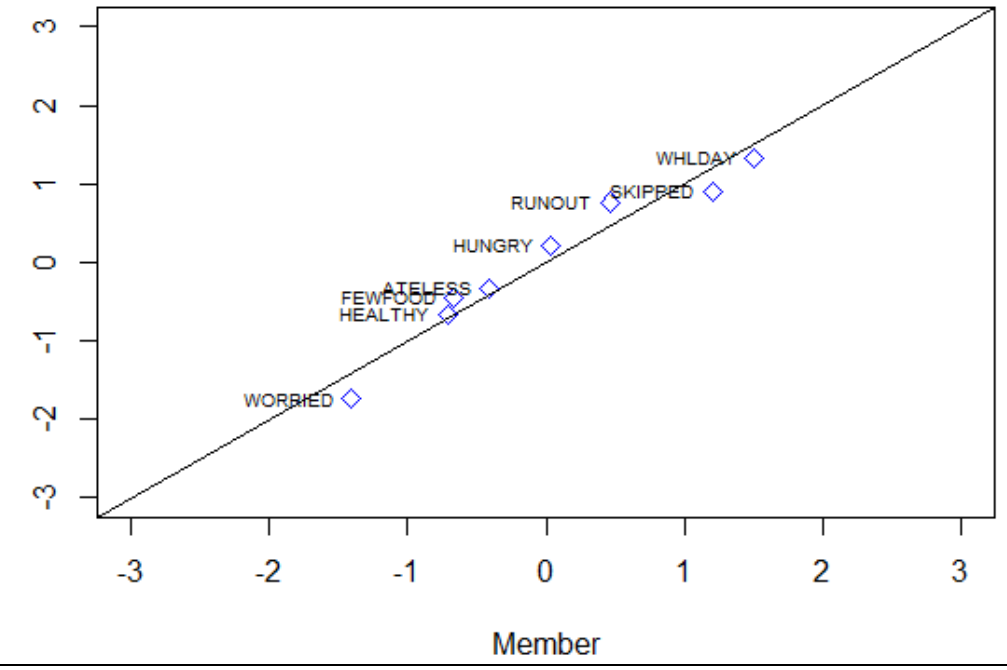
Main sources of income (in percentage per household) by membership



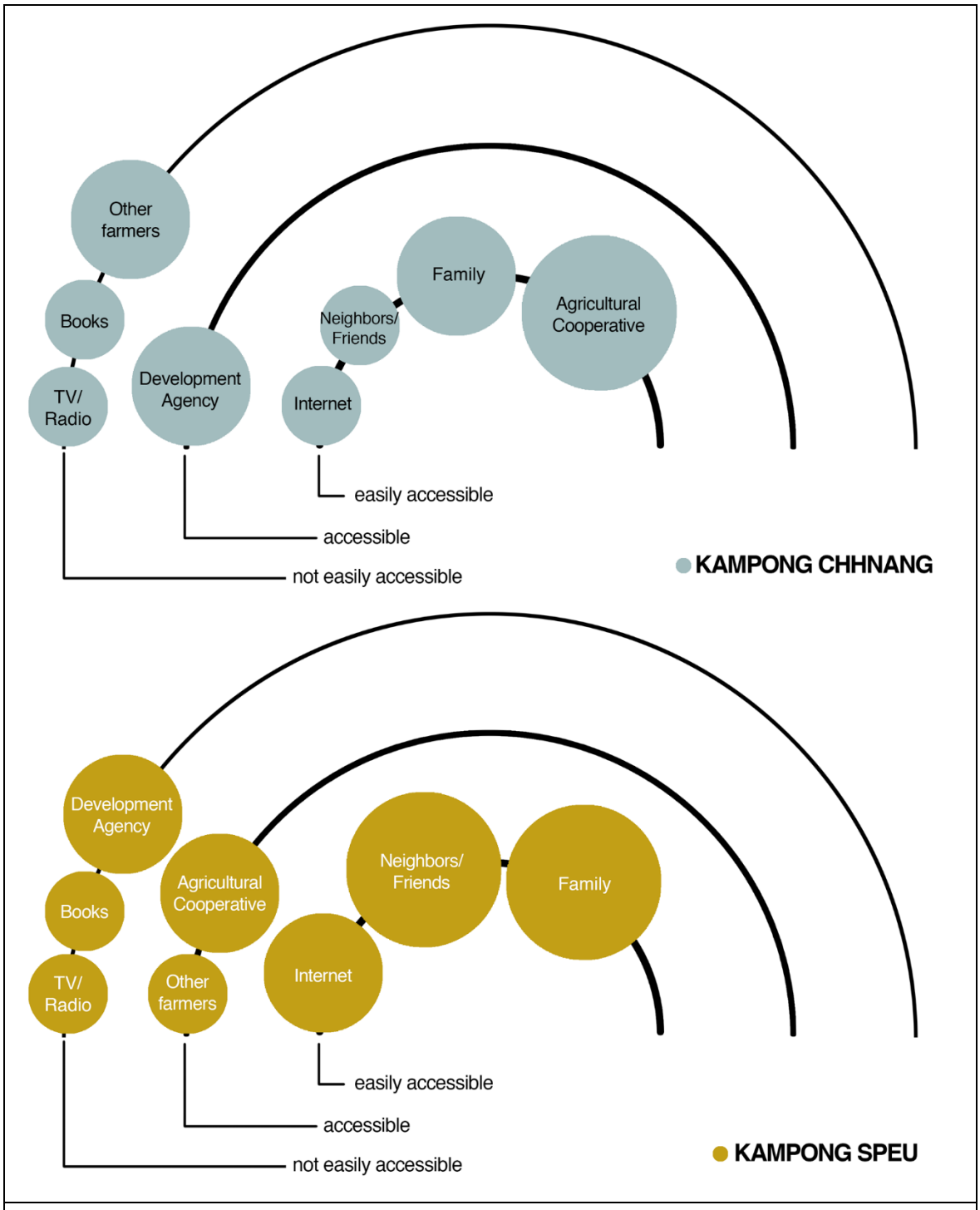
Ways of selling agricultural products by membership



Type of sanitation (in percentages of the respondent households) by membership (Kratie and Kampong Thom province)



AC Members' FIES scores by category plotted against FIES scores of non-members



Importance and accessibility of sources of knowledge in Kampong Chhnang and Kampong Speu provinces

Our **FIES Data** lack external validity and reliability but can be used for internal comparisons (as described in the chapter "Limitations").

Household Perception of Food Security, FIES Raw Score

Variable	Total		Kratie		Kampong Thom	
	Non-Member	Member	Non-Member	Member	Non-Member	Member
Households having been worried in the previous 12 months about not having enough food *(binary)*	0.61 ± 0.49	0.48 ± 0.50**	0.70 ± 0.46	0.56 ± 0.50	0.51 ± 0.51	0.38 ± 0.49
FIES raw score	1.89 ± 1.9	1.51 ± 1.68	2.47 ± 2.01	1.89 ± 1.71	1.18 ± 1.51	0.96 ± 1.49

The difference in the raw score (the sum of affirmative responses used as an ordinal measure of food security) between members and non-members for the total data set is not significant ($p = 0.12 – 0.46$). Also, when we look at the differences for these two variables (worried households, raw score) per province, we cannot determine a significant deviation.

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